

**IS THE PERFECT THE ENEMY OF THE GOOD? THE ROLE OF DIETARY
CHOICES, PERCEPTIONS, AND EXPERIENCES IN MEAT CONSUMPTION
PATTERNS IN THE U.S.**

by

Kathryn Asher

MES, York University, 2006; BA, St. Thomas University, 2003

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of

Doctor of Philosophy

in the Graduate Academic Unit of Sociology

Supervisor: Paul Peters, PhD, Department of Sociology

Examining Board: Gabriela Tymowski-Gionet, PhD, Faculty of Kinesiology, Chair
Gary Bowden, PhD, Department of Sociology
Neeru Gupta, PhD, Department of Sociology

External Examiner: Jessica Greenebaum, PhD, Department of Sociology, Central
Connecticut State University

This dissertation is accepted by the
Dean of Graduate Studies

THE UNIVERSITY OF NEW BRUNSWICK

June 2017

© Kathryn Asher 2017

ABSTRACT

Despite decades of promotion, rates of vegetarianism have changed minimally in the U.S. In part due to this slow growth rate, farmed animal advocates are divided about whether encouraging meat elimination or meat reduction (and which type) is best. Following Voltaire's assertion that the perfect can be the enemy of the good, this research explores whether vegetarianism (the perfect) may be the enemy of the good for realizing advocates' desired social movement outcomes in American society around meat and farmed animals. This dissertation, drawing on applied sociology and positioned at the intersection of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change, examines this research question and speaks to whether social movements should ask for intermediate steps or focus on their desired end goal.

This dissertation engages with an effective animal advocacy lens—a subset of effective altruism—to study the current and future potential impact of three diets promoted to varying degrees by U.S. advocates: a vegetarian diet, a reduced-meat diet, and a chicken-free diet (per the problem of smaller-bodied animals). Quantitative methods were used to consider how these diets can help this social movement “do the most good,” a key tenet of effective altruism. Data was collected from an online census-balanced cross-sectional sample of 30,000+ U.S. adults provided by Nielsen in 2016.

Results showed a reduced-meat diet had the highest prevalence rate among American adults and the largest number of food opinion leaders based on current as well as future potential eating patterns. A reduced-meat diet was the driver for the greatest number of meat-free meals eaten each week and the largest number of adults this is

spread amongst, both taking in current and future potential trends. A reduced-meat diet also had the best external perceptions among those who are not restricting their meat consumption. Lived experiences was the one exception, where a vegetarian diet had the best internal experiences among individuals currently eating one of the diets. These findings suggest that there are reasons to infer that a reduced-meat diet may best support an effective animal advocacy approach to U.S. dietary outreach.

DEDICATION

To those doing the work of doing the most good.

To the subjects of this work.

ACKNOWLEDGEMENTS

I am fortunate to have been supported in my research by the Social Sciences and Humanities Research Council Joseph-Armand Bombardier Canada Graduate Scholarship – Doctoral; the Social Sciences and Humanities Research Council Canada Graduate Scholarship Program – Michael Smith Foreign Study Supplement; a Nels Anderson Field-Research Grant from the Department of Sociology at the University of New Brunswick (UNB); a VegFund Merit Award; a donor with fiscal sponsorship provided by Faunalytics; a New Brunswick Innovation Foundation Graduate Scholarship Award; a UNB Magee Fellowship in the Humanities and Social Sciences; and a UNB Faculty of Arts PhD Graduate Assistantship.

Many people in the Department of Sociology at UNB supported me through this journey. Foremost is my supervisor Dr. Paul Peters, who took me in during the last few years of my studies and provided a calming presence and knowledgeable sounding board, as well as the members of my dissertation supervisory committee (Dr. Gary Bowden and Dr. Elizabeth Cherry) who helped considerably strengthen the final product. Thanks also to Wanda Birch, Tracy McDonald, Dr. Luc Thériault, Dr. Nick Hardy, Dr. Vanda Rideout, and Dr. Lucia Tramonte for their encouragement, support, and advice over the years. I am grateful for my fellow UNB graduate students—particularly Nathan Thompson and Lisa Thomson—who provided an empathetic environment in which to discuss the public and private matters of doctoral life. I also owe Dr. Niyati Parekh much gratitude for the level of academic and personal support she offered during my visiting scholar appointment at New York University. My

appreciation also to New York University's Department of Nutrition and Food Studies for providing an academic home for me during this residency.

Many individuals provided valuable feedback while I was narrowing down my topic area and during the call for feedback on the early research design, including: Matt Ball, Jon Bockman, Greg Boese, Krystal Caldwell, David Coman-Hidy, Nick Cooney, Sabine Doebel, Milena Esherick, Bruce Friedrich, Che Green, Gordon Hodson, Joop Hox, Brian Kateman, Lisa Kramer, Tobias Leenaert, Ginny Messina, Jack Norris, Jacy Reese, Harish Sethu, Allison Smith, and Michael Webermann. Thanks also to Kieran Greig for helping me think through the randomization scheme for the experimental portion of the survey, to Peter Hurford for testing a version of the survey on the Qualtrics platform, and to Dan Crouse and Carolyn Peake for providing early feedback on analytic matters.

My thanks to Che Green of Faunalytics who provided a stimulating work home for me during my degree, which provided both a nice break from, and complement to, my doctoral studies. I learned a remarkable amount from my time at Faunalytics, without which my dissertation would be short on methodological rigour and subject matter expertise. Had it not been for Faunalytics, I would not have had the guts to undertake such an extensive data collection mission nor the confidence to know it could be done. Having a tenure as Faunalytics' research director was a life-changing break for me, which not only changed the trajectory of my career but, in many ways, my life.

I would not have started down the PhD path had it not been for my lifelong interest in justice and vulnerable groups, which was given specific purpose when I developed a concern for animal issues as a child. I am not driven to do "research for research sake" and so having the opportunity to take an applied sociology approach to

my studies gave me a reason to return to academia. The thought experiment of envisioning where my life might be had I not taken this meaningful journey is disquieting for me. Even still, it was never about the self-fulfilling goal of the degree, but rather doing what I could to “do the most good” in the world. I have been fortunate to be inspired and buoyed in my academic efforts by effective altruists and animal advocates alike and whether through their praises or critiques, I have grown considerably as a scholar. No one has inspired me more, however, than the marginalized group I have dedicated my life to bettering.

On a personal note, my genuine appreciation to my partner Adam Gilmore, a steady and patient support—my rock—which manifested in many forms from an understanding ear and reassuring force, to seeing me off on my many academic adventures including masterminding my move to New York City. I look forward to sharing new beginnings together on the other side of this PhD as we anticipate the *miles* ahead.

To my dearest cousin, Corey James Asher, who has always shown such genuine enthusiasm in “DrVeg12”—thank you. We would often remark that “no one is more interested in my PhD,” and that was a title he earned with much enthusiasm. His was a listening ear I treasured and leaned on often because nothing seems insurmountable when you can without fail find the hilarity in it with your best friend.

My deepest gratitude to my family Jim Asher, Jane Asher, and Elizabeth Asher who provided me with a near-weekly university-adjacent home away from home, which has always been filled with such joy, laughter, stimuli, and character. Its energy and irresistible charm has shaped who I am so fully. Unwinding in the “boudoir” with my sister was my favourite way to spend a school night. My mother, a true dynamo,

provided reinforcement, comic relief, and an endless supply of home cooking to fuel another day's work. My father was always at the ready with his wisdom whether it was helping to edit my early papers, sharing advice on teaching, engaging in a lively philosophical debate while holding court in the living room, or offering his signature wave from the front window as I headed off on another day.

Thanks finally to my grandmother Rita Garey, who always placed such significance on my doctorate and moved me with her stories of how university was logistically out of reach for her so many years ago despite a sharp and determined mind. Helping care for her during her last few months was the biggest honour of my life, and gave me tremendous perspective about priorities part-way through my degree. The experience left me with a renewed sense of resilience, which made the upward climb of the PhD seem entirely achievable. And thanks to that, and all the other supports and learnings along the way, here I am, on the other side.

Table of Contents

ABSTRACT.....	ii
DEDICATION.....	iv
ACKNOWLEDGEMENTS.....	v
Table of Contents.....	ix
List of Tables.....	xv
List of Figures.....	xvii
1.0 Introduction.....	1
2.0 Literature Review.....	16
2.1 Effective Altruism.....	17
2.2 Social Movement Outcomes.....	22
2.3 Sociology of Food.....	26
2.4 Dietary Behaviour Change.....	30
2.5 Research Inquiry.....	32
2.6 Concluding Summary.....	41
3.0 Methods.....	43
3.1 Research Questions.....	44
3.2 Diet Groups.....	47
3.2.1 Meat Reducers.....	48
3.2.2 Vegetarians.....	49
3.2.3 Chicken Avoiders.....	50
3.2.4 Non-Reducing Omnivores.....	50
3.3 Study Design.....	51
3.3.1 Cross-Sectional Design.....	51
3.3.2 Web Surveys.....	52
3.4 Sample Size.....	54
3.5 Participants and Procedure.....	56
3.6 Experimental Element.....	58
3.7 Programming.....	59
3.7.1 Randomization.....	59
3.7.2 Survey Look and Feel.....	60
3.7.3 Features.....	61
3.7.4 Testing.....	63

3.8	Materials	64
3.8.1	Survey Instrument	64
3.8.2	Question Wording	64
3.8.3	Multi-item Measures	65
3.8.4	IMC	66
3.8.5	Respondent Appreciation	67
3.9	Measures	68
3.9.1	Dietary Assessment	68
3.9.2	SWFL	74
3.9.3	Previous Diet	75
3.9.4	Familiarity	76
3.9.5	Perception of Prevalence Rate	76
3.9.6	Social Ties	77
3.9.7	Thermometer	77
3.9.8	TTM SOC	78
3.9.9	TPB	78
3.9.10	Barriers	82
3.9.11	Length of Adherence	82
3.9.12	Opinion Leaders	83
3.10	External Feedback	84
3.11	Pilot Testing	85
3.11.1	Cognitive Interviewing	86
3.11.2	Field Testing	90
3.12	Ethical Protocols	91
3.13	Data Collection	94
3.13.1	Quality Control	94
3.13.2	IR Check	95
3.13.3	Sampling	95
3.13.4	Router Allocation Process	95
3.13.5	Invitations	96
3.13.6	Census-Balancing	96
3.13.7	Response Rate	98
3.13.8	Randomization	99
3.13.9	Quotas	101

3.13.10	Soft and Full Launch.....	101
3.14	Data Analysis.....	102
3.14.1	Pre-Analysis Plan.....	102
3.14.2	Statistical Software Package.....	103
3.14.3	Weighting.....	103
3.14.4	Data Cleaning & Coding.....	108
3.14.5	Dataset Iterations	110
3.14.6	Population Estimates.....	113
3.14.7	Pearson’s Chi-Square Test.....	114
3.14.8	ANOVAs & Pairwise Comparisons.....	114
3.15	Concluding Summary	119
4.0	Results.....	120
4.1	Census-Balancing	121
4.2	Randomization	123
4.3	Nonresponse Bias.....	127
4.4	Demographics	128
4.5	Prevalence and Opinion Leaders (Current Impact)	131
4.5.1	Prevalence Rates (Current Impact)	131
4.5.2	Opinion Leaders (Current Impact).....	132
4.6	Prevalence and Opinion Leaders (Future Potential Impact).....	132
4.6.1	Prevalence Rates (Future Potential Impact).....	132
4.6.2	Opinion Leaders (Future Potential Impact)	135
4.7	Meat-Free Meals (Current Impact).....	136
4.7.1	Number of Meat-Free Meals (Current Impact).....	137
4.7.2	Spread of Meat-Free Meals (Current Impact).....	137
4.8	Meat-Free Meals (Future Potential Impact).....	138
4.8.1	Number of Meat-Free Meals (Future Potential Impact)	138
4.8.2	Spread of Meat-Free Meals (Future Potential Impact)	139
4.9	Farmed Animals (Current Impact).....	139
4.9.1	Dietary Assessment.....	140
4.9.2	Farmed Animal Statistics.....	140
4.9.3	Estimates of Farmed Animals Removed from the Food Stream	142
4.9.4	Impact of Diet on Farmed Animals	146
4.10	Farmed Animals (Future Potential Impact)	152
4.11	External Perceptions (Future Potential Impact).....	153

4.11.1	Familiarity (External Perceptions).....	153
4.11.2	Social Ties (External Perceptions).....	155
4.11.3	Thermometer (External Perceptions).....	156
4.11.4	Intentions (External Perceptions).....	156
4.11.5	Attitudes (External Perceptions).....	156
4.11.6	Perceived Behavioural Control (External Perceptions)	156
4.11.7	Subjective Norms (External Perceptions).....	157
4.11.8	SWFL (External Perceptions).....	157
4.11.9	Convenience (External Perceptions).....	157
4.11.10	Social/Personal Life (External Perceptions)	158
4.11.11	Health (External Perceptions).....	158
4.11.12	Cost (External Perceptions)	158
4.11.13	Motivation (External Perceptions).....	159
4.11.14	Identity (External Perceptions)	159
4.11.15	Perception of Prevalence Rate (External Perceptions)	159
4.11.16	TTM SOC (External Perceptions)	160
4.12	Internal Experiences (Current Impact).....	161
4.12.1	SWFL (Internal Experiences)	161
4.12.2	Social Ties (Internal Experiences)	163
4.12.3	Intentions (Internal Experiences).....	163
4.12.4	Attitudes (Internal Experiences)	164
4.12.5	Perceived Behavioural Control (Internal Experiences)	164
4.12.6	Subjective Norms (Internal Experiences).....	164
4.12.7	Convenience (Internal Experiences).....	165
4.12.8	Social/Personal Life (Internal Experiences)	165
4.12.9	Health (Internal Experiences)	165
4.12.10	Cost (Internal Experiences).....	166
4.12.11	Motivation (Internal Experiences)	166
4.12.12	Identity (Internal Experiences)	167
4.12.13	Perception of Prevalence Rate (Internal Experiences).....	167
4.12.14	Length of Diet Adherence (Internal Experiences)	168
4.12.15	Diet Lapses (Internal Experiences).....	168
4.13	Chicken Avoiders.....	169
4.14	Concluding Summary	170

5.0	Discussion.....	171
5.1	Summary of Findings.....	171
5.2	Prevalence and Opinion Leaders (Current Impact)	174
5.2.1	Prevalence Rates (Current Impact)	174
5.2.2	Opinion Leaders (Current Impact).....	179
5.3	Prevalence and Opinion Leaders (Future Potential Impact).....	180
5.3.1	Prevalence Rates (Future Potential Impact).....	180
5.3.2	Opinion Leaders (Future Potential Impact)	181
5.4	Meat-Free Meals (Current Impact)	182
5.4.1	Number of Meat-Free Meals (Current Impact).....	182
5.4.2	Spread of Meat-Free Meals (Current Impact).....	183
5.5	Meat-Free Meals (Future Potential Impact).....	183
5.5.1	Number of Meat-Free Meals (Future Potential Impact)	183
5.5.2	Spread of Meat-Free Meals (Future Potential Impact)	184
5.6	Farmed Animals (Current Impact & Future Potential Impact).....	184
5.7	External Perceptions (Future Potential Impact).....	185
5.7.1	Familiarity (External Perceptions).....	185
5.7.2	Social Ties (External Perceptions).....	186
5.7.3	Thermometer (External Perceptions).....	186
5.7.4	Intentions (External Perceptions).....	188
5.7.5	Attitudes (External Perceptions).....	189
5.7.6	Perceived Behavioural Control (External Perceptions)	189
5.7.7	Subjective Norms (External Perceptions).....	190
5.7.8	SWFL (External Perceptions).....	190
5.7.9	Convenience (External Perceptions).....	191
5.7.10	Social/Personal Life (External Perceptions)	192
5.7.11	Health (External Perceptions)	193
5.7.12	Cost (External Perceptions)	194
5.7.13	Motivation (External Perceptions).....	195
5.7.14	Identity (External Perceptions)	195
5.7.15	Perception of Prevalence Rate (External Perceptions)	196
5.7.16	TTM SOC (External Perceptions)	197
5.8	Internal Experiences (Current Impact).....	197
5.8.1	SWFL (Internal Experiences)	199
5.8.2	Social Ties (Internal Experiences)	200

5.8.3	Intentions (Internal Experiences)	200
5.8.4	Attitudes (Internal Experiences)	201
5.8.5	Perceived Behavioural Control (Internal Experiences)	201
5.8.6	Subjective Norms (Internal Experiences)	202
5.8.7	Convenience (Internal Experiences)	203
5.8.8	Social/Personal Life (Internal Experiences)	204
5.8.9	Health (Internal Experiences)	205
5.8.10	Cost (Internal Experiences).....	206
5.8.11	Motivation (Internal Experiences)	206
5.8.12	Identity (Internal Experiences)	207
5.8.13	Perception of Prevalence Rate (Internal Experiences).....	210
5.8.14	Length of Diet Adherence (Internal Experiences)	210
5.8.15	Diet Lapses (Internal Experiences).....	211
5.9	Chicken Avoiders.....	211
5.10	Limitations	213
5.11	Concluding Summary	218
6.0	Conclusion	219
6.1	Review of Findings	220
6.2	Implications of Findings	224
6.3	Directions for Future Research	234
6.4	Concluding Summary	241
	References.....	242
	APPENDIX A – Research Questions	259
	APPENDIX B – Survey Flow	267
	APPENDIX C – Cognitive Interviewing Instructions and Probes	271
	APPENDIX D – Dataset Flow Charts	277
	APPENDIX E – Meat Reducers Diet Discrepancy	281
	APPENDIX F – Survey Instrument.....	291
	CURRICULUM VITAE	

List of Tables

Table 1. The Vegetarian Resource Group Polls with U.S. Adults 18+ years	32
Table 2. U.S. Per Capita Meat Consumption and Farmed Animal Slaughter Totals	34
Table 3. The Vegetarian Resource Group's Polls with U.S. Adults 18+ years	36
Table 4. Weighted and Unweighted Targets and Weights Applied.....	107
Table 5. U.S. Population Estimates for 18 Years and Over.....	113
Table 6. Census-Balancing	121
Table 7. Demographic Characteristics of Samples for Meat Reducers and Omnivores Devised Through Randomization from the Weighted Cleaned Sample Leaving the Screener.....	124
Table 8. Demographic Characteristics of Sub-Samples for 3 Non-Reducing Omnivore Groups Devised Through Randomization from the Frozen Analytic Sample	126
Table 9. Non-response bias analysis.....	128
Table 10. Demographic Characteristics, from the Weighted Cleaned Sample Leaving the Screener.....	129
Table 11. Prevalence Rates	131
Table 12. Opinion Leader Prevalence.....	132
Table 13. Non-reducing omnivores' potential to adopt.....	134
Table 14. Future Estimated Prevalence Rates.....	135
Table 15. Future Estimated Opinion Leaders	136
Table 16. Weekly Meatless Meals	137
Table 17. Spread of Weekly Meatless Meals.....	138
Table 18. Future Projected Weekly Meatless Meals	139
Table 19. Future Projected Spread of Weekly Meatless Meals	139
Table 20. FFQ Scale Conversion	140
Table 21. Land-based Farmed Animals Killed Annually in the U.S. in 2015	141
Table 22. Import Totals 2015.....	143
Table 23. Export Totals 2015.....	144
Table 24. Land-based Farmed Animals Slaughtered for the U.S. Meat Supply in 2015	145
Table 25. Land-based Farmed Animals Slaughtered + Mortalities for the U.S. Meat Supply in 2015	146
Table 26. Farmed Animals Killed by Meat Type Annually in the U.S. in 2015	147
Table 27. Per Capita Number of Farmed Animals Impacted by Diet Type Annually in the U.S.....	148
Table 28. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Vegetarians 18+ Years	151
Table 29. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Chicken Avoiders 18+ Years	151
Table 30. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Vegetarians (Future Potential Eating Patterns).....	152
Table 31. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Chicken Avoiders (Future Potential Eating Patterns)	153
Table 32. External Perceptions – ANOVAs & Pairwise Comparisons	154
Table 33. Difference Between Perceived and Actual Prevalence Rates (External Perceptions).....	160

Table 34. TTM SOC	161
Table 35. Internal Experiences – ANOVAs & Pairwise Comparisons	162
Table 36. Difference Between Perceived and Actual Prevalence Rates (Internal Experiences).....	167
Table 37. Length of Diet Adherence in Years	168
Table 38. Prevalence of Lapsed Dieters	169
Table 39. Lapsing Rates.....	169
Table 40. Diets’ Ranking on Indicators	173
Table 41. FFQ Scale Conversion	282
Table 42. Mean Daily Servings (Transformation)	283
Table 43. Mean Frequency (1 to 9 Scale).....	284
Table 44. Median Daily Servings (Transformation).....	285
Table 45. Weekly Meal Consumption	286

List of Figures

Figure 1. Research Questions	266
Figure 2. Survey Flow 1.....	267
Figure 3. Survey Flow 2.....	268
Figure 4. Survey Flow 3.....	269
Figure 5. Survey Flow 4.....	270
Figure 6. Screened Sample	277
Figure 7. Screened Sample (cont'd).....	278
Figure 8. Weighted Cleaned Sample	279
Figure 9. Frozen Analytic Sample	280

1.0 INTRODUCTION

Meat has long dominated the American plate thanks to its prized position in U.S. culture atop the food hierarchy (Twigg, 1983). Increasingly, however, meat's role in U.S. society is being critiqued because of its impact on animals¹ (Baur, 2008; Robbins, 2001; Safran Foer, 2009; Singer, 1990; Singer & Mason, 2006), human health (Craig & Mangels, 2009; Simon, 2013a), the environment (Eshel, Martin, & Bowen, 2010; Food and Agriculture Organization of the United Nations, 2006; Goodland & Anhang, 2009; Marlow et al., 2009; Pimentel & Pimentel, 2003; Reijnders & Soret, 2003), world hunger (Chiu & Lin, 2009; Lewis, 1994), and social justice issues (Adams, 2004; Dillard, 2008; Human Rights Watch, 2004; Nibert, 2002).

There are signs that the dominance of meat in America is waning. Per capita meat consumption (excluding fish) was down by 11 lbs in 2015, compared to the high in 2004 (National Chicken Council, n.d.). A total of 455 million fewer land-based farmed animals² were used for food in 2014 than during the peak in 2008 (The Humane Society of the United States, 2015).³ Despite this, Americans' per capita consumption of land-based meat was still 211 lbs in 2015 (National Chicken Council, n.d.), which necessitated the use of more than eight billion land-based farmed animals that year.⁴

¹ The term “animals” is used here as a shorthand for nonhuman animals. Its use is not meant to downplay the commonality between humans and other animals but rather was chosen to simplify the language in the paper.

² Sometimes shortened herein to farmed animals.

³ These statistics take in animals used for food that are farmed including cattle, chickens, ducks, pigs, sheep, lambs, and turkeys, but do not include rabbits, fish, crustaceans, or other farmed animals not reported by the United States Department of Agriculture.

⁴ This figure factors in imports and mortality rates, and factors out exports. See the section “Estimates of Farmed Animals Removed from the Food Stream” for details on these calculations.

The main social movement promoting change in meat consumption is the animal advocacy movement.⁵ While this movement has roots in the 18th century (DeMello, 2012, p. 396), its current manifestation, which is sometimes called its second wave, emerged in the late 1970s (DeMello, 2012, p. 406; Finsen & Finsen, 1994, p. 3). The movement focuses on addressing the harm imposed on animals *by humans*.⁶ The movement considers the multitude of ways that humans use animals and has a variety of goals and desired outcomes as well as strategies and tactical repertoires.

Farmed animals have increasingly become one of the movement's central interests, for reasons of scale and the potential for impact (Animal Charity Evaluators, 2016a; Cherry, 2016, p. 19). This was not always the case (DeMello, 2012), nor is it reflected in current charitable spending on animals, given that 99.6% of the animals killed by humans in the U.S. are farmed animals, while only 0.8% of the money donated to animal charities is directed to farmed animal organizations (Animal Charity Evaluators, 2016c).

In some ways, the farmed animal segment of the movement can be conceptualized as a lifestyle movement (Haenfler, Johnson, & Jones, 2012) in that many advocates promote individual dietary modification as a way to foster social change. There are many other approaches outside of individual behaviour change, including corporate change, legislative reform, legal advocacy, technological advancements, and

⁵ The animal advocacy movement, also referred to as the animal rights or animal protection movement, is shorthand herein as “the movement.” It is referred to as a singular entity, which is not meant to sidestep the diversity in perspectives and approaches or the adversarial relationship between some of its members.

⁶ While this is the overwhelming focus, there has been an interest in recent years, especially among effective altruists, in wild animal suffering which includes harm done to animals that is not caused by humans. See for example the work of Animal Charity Evaluators (2014b, 2016a).

outreach aimed at changing attitudes rather than behaviour to incite a large-scale social movement. For this research project, the focus is solely on farmed animals and individual diet modification.

One of the prominent debates in farmed animal advocacy concerns the fact that despite decades of advocacy, rates of vegetarianism⁷ have changed minimally in the U.S. (The Vegetarian Resource Group, n.d.). In part due to the slow growth in the rates of vegetarianism, there are deep divisions within the movement (both ideological and practical) concerning whether advocating for meat elimination or for meat reduction (and which type) will most effectively help reach advocates' desired social movement outcomes in American society around meat⁸ and farmed animals. The question of whether to promote reductions or eliminations remains a foundational, yet unanswered question for advocates (Sentience Institute, 2017).

Over time, the movement's outreach, organizational make-up, and membership has diversified from predominantly focusing on promoting meat-free (and indeed animal-free) eating to one that also embraces reductions. While societies promoting vegetarianism in the U.S. date back to the 1800s (Cherry, 2016, p. 15), a variety of established organizations such as the Humane Society of the United States, Mercy for

⁷ Vegetarianism is being used herein as a shorthand for a meat-free diet and so includes veganism (one that additionally excludes eggs, dairy, and other animal products). The distinction was made clear to survey respondents. The terms vegetarian and vegan are also being used to refer to dietary habits, as opposed to broader lifestyle choices.

⁸ Meat in and of itself is not necessarily problematic to advocates but rather conventionally-produced meat given that many in the movement support replacing the existing meat supply with clean (otherwise known as cultured) meat. See for example the work of New Harvest and The Good Food Institute as well as People for the Ethical Treatment of Animals' (PETA) one million dollar prize for bringing cultured chicken onto the market (People for the Ethical Treatment of Animals, n.d.). Given this, "meat" will be used herein as a shorthand for conventionally-produced meat.

Animals, and The Humane League now conduct outreach that also asks individuals to *reduce* their meat intake rather than eliminate it. Organizations such as Vegan Outreach began promoting reductions as a positive step because of negative associations with terms such as vegan and the “all or nothing” form it takes (Cherry, 2016, p. 72). There are newer organizations as well that have formed with the sole purpose of promoting meat reduction generally (for example the Reductarian Foundation) or a specific type of reduction (One Step for Animals’ focus on chicken avoidance).

Movement strategists have also begun raising the call for reduction efforts including Leenaert (2015a) who believes that advocates should place a greater focus on meat reduction, possibly even more so than on elimination. Outside efforts have buoyed the movement’s reduction work as well, including Johns Hopkins Bloomberg School of Public Health’s Meatless Monday campaign, Mark Bittman’s Vegan Before 6:00 program, and Graham Hill’s call for weekday vegetarianism. Still, there remains serious opposition in the movement from individuals (often termed abolitionists) who believe that promoting anything less than veganism is both ideologically and tactically problematic, most notably Gary Francione and Casey Taft.⁹

Many farmed animal advocates are concerned about the question of whether to promote meat reduction or vegetarianism because it has the potential to have a direct impact on their social movement’s success. Many of the bigger organizations (e.g., Mercy for Animals and The Humane League) use a mixed approach because they

⁹ Francione is a professor at Rutgers School of Law and runs the website “Animal Rights: The Abolitionist Approach.” Casey Taft is a professor of Psychiatry at Boston University School of Medicine and co-founder of Vegan Publishers.

believe it may help their effectiveness, while Francione and Taft are vocal proponents of an exclusive focus on veganism primarily because of fears about reduction messaging undercutting moral concern for animals. As Leenaert (2017) explains, while there is no consensus about which approach is best, there is also no agreement on which approach the movement has principally pursued thus far. Some advocates critique the movement for not focusing enough on an animal-free message, while others believe an over-emphasis on the animal-free message has slowed progress.

The matter of meat reduction versus elimination is being examined here using the lens of effective altruism. Effective altruism is an initiative—some even say a social movement (Singer & MacAskill, 2015, p. viii)—that “commits itself to using empirical methods to work out how to do the most good” (Matthews, 2015). The idea is that one can “‘do good better’ by thinking scientifically rather than sentimentally” (Thompson, 2015).

There is an existing interest in effective altruism among a segment of animal advocates—often referred to as the field of effective animal advocacy (EAA)—who wish to reduce suffering in the most effective ways possible. This research builds on their efforts (see for example the work of Peter Singer and Animal Charity Evaluators). Effectiveness has also been a movement focus in other ways outside of effective altruism circles through what Cherry (2016, pp. 119-120) describes as the movement’s “institutional logic of pragmatism,” reflected in the use of organizational programs and materials as well as movement conferences to train advocates to be more effective. Cherry’s (2016, p. 121) work found “the institutional logic of effectiveness to be so strong that it overshadowed all other considerations,” whereby advocates would even opt for approaches they personally opposed if they believed them to be effective.

Not all effective altruists working in farmed animal advocacy define “doing the most good” in the same way. For some advocates, the primary metric is the number of lives that are “saved” (Fried, 2015). Other Effective Animal Advocates (EAAs) focus on the extent to which harm is reduced, which could mean focusing on days of suffering (Cooney, 2014, p. 6; Tomasik, 2007), degree of suffering (Cooney, 2014, p. 6; Norwood & Lusk, 2011; Tomasik, 2007), or even brain size (Tomasik, 2007). Others are concerned with the extent to which the movement is growing and society is transforming (Direct Action Everywhere, n.d.). In contrast, some in the animal advocacy movement are not driven by effective altruism but rather by doing what they believe to be a moral imperative: promoting a meat-free—indeed an animal-free—existence (e.g., Francione). These individuals have been some of the most vocal critiques of meat reduction efforts.

Following Voltaire’s assertion that the perfect can be the enemy of the good, this research explores whether vegetarianism’s meat elimination (the perfect) may be the enemy of the good for realizing advocates’ desired social movement outcomes in American society around meat and farmed animals. Animal advocate Henry Spira has said, “if you go for all-or-nothing, it is a good way to get applause, but it is not a good way to make progress” (Satya, 2004). This research asks whether this could be true. It questions whether the promotion of vegetarianism does less to meet the movement’s goals than advocating (the interim step of) reduced meat consumption.

This dissertation—positioned at the intersection of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change—examines this research problem. An EAA lens is used to study the current and future potential

impact of three diets¹⁰ promoted by the U.S. animal advocacy movement—a vegetarian diet, a reduced-meat diet, and a chicken-free diet¹¹—to consider how the diets can help the movement “do the most good,” a key tenet of effective altruism. This research provides an example of how effective altruism has the potential to inform social movement goals—in this specific case through a better understanding of the impact of dietary choices, perceptions, and experiences.

One central research question guides this research: *Which of several meat-restricted diets (a vegetarian diet, a reduced-meat diet, or a chicken-free diet) would best support an EAA approach to dietary outreach in the U.S.?* This question is answered by exploring the eight research questions (most of which also have nested research questions) that are found in Appendix A – Research Questions. The research questions focus on several topics, including: diet prevalence rates; rates of food opinion leaders;¹² numbers of meat-free meals consumed; the spread of meat-free meal consumption; the impact on farmed animals; external perceptions; and internal experiences. Data was collected from an online census-balanced cross-sectional sample of 30,000+ U.S. adults provided by Nielsen in 2016. This sampling procedure allows the results to be of consequence for the many advocacy organizations who operate at the national level. A census-balanced sample was also crucial in establishing reliable

¹⁰ These three diets are often shorthand herein as meat-restricted diets.

¹¹ Chicken avoidance was explored rather than chicken reduction because the latter is a harder dietary pattern to isolate (one of the limitations, as will be discussed, of the reduced-meat diet).

¹² Opinion leaders on food are those individuals who self-report influencing others’ attitudes and choices around food.

prevalence rates for the diets under study as well as adding strength to the projections made in the dissertation.

It is worth noting that the animal advocacy movement is not solely concerned about meat but also animal byproducts such as eggs and dairy. Meat is the focus of this research, however, which ensures the topic is sufficiently narrow to be a feasible area of study. This decision also reflects the fact that the difference in impact between vegetarians and vegans is relatively small. As Cooney notes, “vegetarians do almost as much good for farm animals as vegans. They reduce 88 percent as many days of suffering, and spare 94 percent as many lives” (2014, p. 12).

The differing impact of the three diets is explored in relation to their current and future potential impact concerning: 1) the prevalence rates of the three groups among American adults and the rates of food opinion leaders among them; 2) the extent of meat-free meals eaten and the number of people this is spread amongst; 3) the number of land-based farmed animals raised for meat removed from the food stream;¹³ 4) how external perceptions differ among those not currently restricting their meat consumption;¹⁴ and 5) how internal experiences differ for individuals currently eating one of the diets. There is a focus on both current and future potential impact because of the importance of understanding the tangible effects being realized now in addition to projections for change given effective altruism’s interest in the far future (Sentience

¹³ The term food stream is used as a shorthand for the meat food stream since this dissertation does not consider other animal products such as dairy, eggs, etc.

¹⁴ The phrase “not currently restricting their meat consumption” is used to reference individuals who are not eating one of the three meat-restricted diets under study. This is not to imply that there are no other ways to restrict one’s meat consumption, which some in this group may be doing.

Politics, n.d.). Importantly, the chosen set of indicators narrows the takeaways stemming from this research and a different set of markers could have resulted in very different findings. An explanation of each indicator is provided in turn:

1. This research estimates the proportion of U.S. adults that are currently adhering to the three diets under study and the proportion of food opinion leaders among them. The willingness to adopt one of the diets by those who are not restricting their meat consumption is also used to consider how these indicators may change in future. Prevalence rates were selected as an indicator because they are a common metric in food-based animal advocacy—see for example Faunalytics (2010). Rogers’ (2003) work on the diffusion of innovations informed the focus on opinion leaders and the decision to give weight to individuals who self-report influencing other people’s attitudes and choices around food.
2. The research also estimates the number of meat-free meals eaten each week and how this is spread among American adults. The willingness to adopt one of the diets by those who are not restricting their meat consumption is used to consider how these indicators may change in future. The work of Leenaert (2017) motivated the focus on meat-free meals (in contrast to solely meat-free individuals) as well as the importance of the “spread” of eating patterns and its role in the availability of alternatives and increasing social acceptance.
3. Diet prevalence rates, food frequency consumption data, U.S. Census figures, and data from the United States Department of Agriculture were used to estimate the number of land-based farmed animals raised for meat who are removed from the food stream based on the current eating patterns of Americans adhering to one of the three diets. The willingness to adopt one of the diets by those who are

not restricting their meat consumption was used to consider how this indicator may change in future. The number of farmed animals has been cited as one of the key metrics for assessing the efficacy of advocacy (Animal Charity Evaluators, 2016a; Cooney, 2014, p. 5).

4. The study also examines how the external perceptions of the three diets differ among American adults who are not currently restricting their meat consumption. The study assessed individuals' familiarity with the diets, their view of the prevalence rates, and their social ties with, and attitudes toward, those who eat this way. Individuals also noted their willingness to adopt one of the diets as well as their impressions of them based on the Transtheoretical Model's Stages of Change (TTM SOC) and the Theory of Planned Behaviour (TPB).¹⁵ Respondents also indicated how they believe their satisfaction with food-related life (SWFL) would change on the diets and what their experience would be like in terms convenience, social/personal life, health, cost, motivation, and identity. Topics concerning adoption potential and barriers were chosen because they have been a movement focus (Cooney, 2014, p. 81; Faunalytics, 2007).
5. Finally, the research determines how lived experiences differ among American adults who are currently eating one of these meat-restricted diets. The study examined individuals' food satisfaction, their perception of prevalence rates, their length of diet adherence, past diet lapses, and social ties with others who eat

¹⁵ The TTM assesses various stages of change, including both cognitive and behavioural stages. The TPB posits that the probability that an individual will engage in a behaviour that is aligned with an attitude is related to how strong their intention is, which can be predicted in three ways: attitude toward the behaviour, perceived behavioural control, and subjective norms.

this way. These individuals also indicated what their experience is like in terms of convenience, social/personal life, health, cost, motivation, and identity. This indicator was informed by the sociology of food (Germov & Williams, 2008a), particularly as it relates to the maintenance and rejection of meat-free and meat-reduced diets (Beardsworth & Keil, 1992; Fox & Ward, 2008; Haverstock & Forgays, 2012).

This work draws on the field of applied sociology, which ventures to resolve social problems through the practical application of sociological methods and knowledge (Wimberley, 1998, p. 6). Sociological research is used in this way to find answers to real-world and practical social questions, whether in the private, public, or interpersonal spheres (Wimberley, 1998, pp. 7 & 19). Applied sociology considers what “ought to be” and looks beyond pure sociology’s focus on the past and present, towards the future and improvement (Ward, 1906, p. 6). While pure sociology is said to answer the question of *what*, *why*, and *how*, applied sociology is concerned with the question *what for*, with a focus on the purpose or end (Ward, 1906, p. 5).

Applied sociology is thought of as an important field to foster given concerns that there is a scarcity of applied research (Wimberley, 1998, p. 7) and that “we spend precious little time applying the sociology we do know and understand” (Wimberley, 1998, p. 5). Applied sociology is believed to advance science as a whole by not only valuing “research that tests theories for their own sake” but going further to pursue answers to specific social problems (Wimberley, 1998, p. 9). In this way, scientific research can be valued both for its basic propensity to advance general knowledge and its practical uses (Whyte, 1998, p. 16), which is one of the goals of this research. Dasgupta & Driskell hold that applied sociology provides a “balance between

knowledge-sociology and use-sociology” (2007, p. ix) and that by necessity, explorations about the social world must be at once “an intellectual task, a moral task and a political task” (2007, p. 6).

In addition to contributing to the field of applied sociology, this doctoral research adds to the literature on meat reduction versus vegetarianism, which has been a topic of deliberation in EAA circles. The question of whether to promote reductions or eliminations has, to date, been a foundational yet unanswered question for EAAs. While there is substantial internal dialogue on this matter among animal advocates, there are few studies that provide empirical evidence for consideration. While a handful of studies have explored this topic using intervention research, this dissertation offers a further perspective from a cross-sectional perspective. This research is exploratory rather than an experimental intervention and so cannot address causation. Consequently, while the findings can speak to many current and projected trends around the different diets, they cannot address which *messaging approach* is most effective. The dissertation also adds to knowledge on how social movement organizations can address concerns about industrial animal agriculture—one of effective altruism’s top priorities—by understanding more about diet modification patterns.

More generally, the research offers insight into a much-debated topic among social movements concerning how to increase impact. It provides insights broadly into social movement strategy and how social movements can influence impact for their cause. Specifically, it examines the question of whether social movements should ask for smaller, intermediate steps, or whether they should focus on their desired end goal. This dissertation offers data that directly addresses this under-studied area in animal advocacy and has broader significance for scholars who study social movement strategy and

outcomes in a variety of other social justice fields. However, in so doing, this work recognizes that predicting social movement outcomes is a difficult endeavour, that claims of causality can be misleading, and that change can impact a movement in unexpected ways.

This doctoral work is distinctive in offering an examination of many variables across several diets, observed from both an insider and an outsider perspective. In most cases, the same variables were collected across all survey paths, allowing for a rich and comparative dataset. The study is also useful in providing a large weighted census-balanced sample sourced from a well-respected panel provider. It also lays plans for the public release of the dataset and code to allow other researchers to uncover new insights and to revisit findings addressed herein with a different analytic approach.

In addition, the dissertation contributes to an understanding of the sociology of food through findings that speak to the fact that food consumption is woven into our social fabric and that food is used to satisfy a host of socially determined needs. The survey results show that far more than nutrition and the need to satisfy hunger determine dietary intentions and maintenance. The research also speaks to how perceptions and experiences across various meat-restricted diets can be examined to understand the levers of behaviour change including dietary intentions, attitudes, perceived behavioural control, and subjective norms. It also demonstrates that the cognitive stages of change (precontemplation, contemplation, preparation) can be useful to consider readiness to change and the potential for uptake.

With such a large proportion of Americans reporting that they are reducing their meat consumption (particularly in comparison to vegetarians), this dissertation is beneficial in demonstrating that meat reducers are a larger group than researchers

previously imagined. Meat reducers are an important and under-studied segment of the population, which allows this study to contribute to the advancement of scholarly knowledge in this area given that to date the sociology of food has focused on vegetarians rather than this potentially influential population of meat reducers.

This dissertation also offers the first insights about chicken avoidance—including the first reliable estimate of the proportion of chicken avoiders in the U.S. adult population—made more innovative by its focus on both the perceptions by outsiders and the lived understandings of current avoiders. This is meaningful considering that this diet speaks to the issue of smaller-bodied animals, a phenomenon that has also become a topic of interest among EAAs given that U.S. omnivores eat vastly more chickens than other land-based farmed animals such as pigs and cows.

The dissertation is organized around five chapters. Chapter 2 addresses the dissertation's positioning at the intersection of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change, as well as the research problem at hand. Chapter 3 discusses the dissertation's methodology, including the cross-sectional design, administration of the web survey, how the diets were operationalized, the use of sample size projections, the experimental component, and the online programming features. The study's materials and data analysis procedures are discussed as well as the process of securing external feedback, pilot testing, and ethical protocols. Chapter 4 touches on the dataset's key characteristics with the bulk of the chapter reserved for a review of the findings for the eight indicators used in the research. Chapter 5 discusses the dissertation's results with a consideration of how they integrate with the current literature as well as which findings were unexpected. Finally, Chapter 6

summarizes the dissertation's purpose and approach, provides a summary of the results, discusses the implications of the findings, and suggests directions for future research.

2.0 LITERATURE REVIEW

This chapter discusses the ways in which the dissertation is positioned at the intersection of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change. Effective altruism and its commitment to using empirical methods to “do good better” informs this research. However, doing good in the areas of meat consumption and reduction can encompass many topics, including animal protection, the environment, human health, world hunger, and social justice. Further, progress on one front may impede that of another. Given these contradictory goals, justification is offered for isolating the animal protection frame for these purposes as the mechanism by which to assess which of several meat-restricted diets would best support an EAA approach to dietary outreach in the U.S.

This section also examines social movement outcomes research and considers a variety of outcomes and the reasoning for why this study focuses on both short-term and projected long-term effects. The dissertation’s emphasis on the understudied area of cultural outcomes is discussed, which is most closely related to the external perceptions findings. The chapter also considers the field of the sociology of food. An understanding of food consumption as a sociological phenomenon is a fundamental tenet of this research, and the chapter explains why the sociology of food offers a solid theoretical grounding to consider the social determinants of the adoption, maintenance, and rejection of meat-free and meat-reduced diets. This research also draws on a few major theories of behaviour change, including the TTM SOC and the TPB.

Finally, this chapter considers the research problem in further detail. While the animal advocacy movement has traditionally advocated meat abstention, there is the

increasing question of whether promoting vegetarianism is the most expeditious way to realizing advocates' desired social movement outcomes. This chapter outlines the debates and existing evidence on the topic and makes a case for why a third option (chicken avoidance) is also worthy of exploration given the problem of smaller-bodied animals.

2.1 Effective Altruism

The focus of this research is on efficacy in social movements, specifically effective altruism and its commitment to doing “the most good.” Effective altruism is an initiative—some even say new social movement (Singer & MacAskill, 2015, p. viii)—that “commits itself to using empirical methods to work out how to do the most good” (Matthews, 2015). The idea is that one can “do good better” by “thinking scientifically rather than sentimentally” (Thompson, 2015). Effective altruism, a relatively new phenomenon, is said to have arisen from “recent developments in economics, psychology and moral philosophy” and was cemented with the founding of the Centre for Effective Altruism in 2011 and a highly publicized talk by Peter Singer in 2013 (Singer & MacAskill, 2015, pp. xii & xiv).

Cause prioritization is a key aspect of effective altruists' work and to date has focused on several key areas. Alleviating poverty in the developing world is a prominent focus, which is understood broadly as taking in “economic benefit, better health, and better education” (Muehlhauser, 2015, p. 100). Expanding the effective altruism movement and other more “meta” initiatives is also a focus, which includes “raising awareness of the importance of evidence-based altruism, helping effective altruists reach

their potential, and undertaking research to help them decide where to focus their efforts” (Muehlhauser, 2015, p. 102).

The far future is another cause spotlighted by effective altruists, who work to find ways to mitigate things such as existential risk given that “many effective altruists value future people roughly as much as currently-living people, and therefore think that nearly all potential value is found in the well-being of the astronomical numbers of people who could populate the far future” (Muehlhauser, 2015, p. 103). A final key priority is the reduction of animal suffering, given that “animals vastly outnumber humans, and growing numbers of scientists believe that many animals consciously experience pleasure and suffering” (Muehlhauser, 2015, p. 104).

Effective altruism has various practical applications. Some effective altruists use the principles above to strategically choose their career path—with guidance from initiatives like 80,000 Hours—whether it be working directly for an effective altruism organization or “earning to give” by choosing a high paying career that allows them to donate a notable proportion of their earnings to effective charities. Many effective altruists seek to maximize the impact of their philanthropic donations by seeking recommendations on where their dollars can have the biggest impact from organizations such as GiveWell and Animal Charity Evaluators that assess the effectiveness of human and animal-focused charities respectively.

A notable level of financial support has been directed to effective altruism causes. Singer and MacAskill note that GiveWell alone “has already raised over \$30 million, and now advises GoodVentures, a \$3 billion foundation” (2015, p. x). For animal-focused causes, in 2016 Animal Charity Evaluators helped direct more than \$3.5 million to their recommended charities (Animal Charity Evaluators, 2017).

While the focus of this research is “doing good better,” doing so in terms of meat consumption and reduction can encompass many topics including animal protection, the environment, human health, world hunger, and social justice. Many scholars and writers have offered arguments for why farmed animals should be protected from human harm. Some have put forth theories related to speciesism (Dunayer, 2004; Singer, 1990) and moral rights (Regan, 1983). Some arguments have focused on physical harm (Baur, 2008; Robbins, 2001; Safran Foer, 2009; Singer & Mason, 2006), while others have narrowed in on animals’ intelligence and emotional capabilities (Hatkoff, 2009; Moussaieff Masson, 2003). Some scholars have cited animal protection efforts as being—or at least being something that will be looked back on as—among the most transformative struggles for social change in history (Joy, 2013; Singer, 1990, p. i).

Public discourse and literature has also emphasized human health promotion as a reason to decrease meat consumption. The Academy of Nutrition and Dietetics has cited meat-free diets as having benefits for disease prevention. They note:

Vegetarians and vegans are at reduced risk of certain health conditions, including ischemic heart disease, type 2 diabetes, hypertension, certain types of cancer, and obesity. Low intake of saturated fat and high intakes of vegetables, fruits, whole grains, legumes, soy products, nuts, and seeds (all rich in fiber and phytochemicals) are characteristics of vegetarian and vegan diets that produce lower total and low-density lipoprotein cholesterol levels and better serum glucose control. These factors contribute to reduction of chronic disease (Academy of Nutrition and Dietetics, 2016).

The consumption of meat and dairy has been said to be associated with a third of cancers, diabetes, and heart disease cases in the U.S., and the cost of treatment is thought to be around \$314 billion annually, representing three-fifths of Medicare spending in the U.S. (Simon, 2013b).

Environmental concerns are also increasingly cited. The United Nations listed animal agriculture as one of the top causes of the most severe environmental threats when it comes to issues of “land degradation, climate change and air pollution, water shortage and water pollution and loss of biodiversity” (Food and Agriculture Organization of the United Nations, 2006, p. xx). The United Nations believes that the livestock sector is contributing more toward global warming than the entire transportation sector combined (Food and Agriculture Organization of the United Nations, 2006, p. 272). Researchers have pointed to meatless diets as having far less impact on the environment compared to diets containing meat and other animal foods (Eshel et al., 2010, p. 1; Marlow et al., 2009, p. 1699S; Pimentel & Pimentel, 2003, p. 660S; Reijnders & Soret, 2003, p. 664S).

In addition to concerns about animal protection, health, and the environment, other common concerns include human hunger relief (Chiu & Lin, 2009; Lewis, 1994) and social justice motivations such as the link between the oppression of human and nonhuman animals (Nibert, 2002), including issues of gender equality (Adams, 2004), labour (Dillard, 2008; Human Rights Watch, 2004; Oxfam America, 2015), and income and racial disparities (DeMello, 2012).

While this research explores ways to decrease meat consumption to “do good better,” progress on one front may impede that of another. For instance, the average U.S. omnivore consumes 28 chickens annually but only an eighth of a cow (Cooney, 2014, p. 4). Thus, from an animal protection standpoint, it may make sense to promote reductions in chicken consumption with more vigour than trying to alter beef intake. From a health and environmental viewpoint, however, it may be the opposite. While considerable research links the consumption of red meat from cows and pigs to diseases such as

cancer, diabetes, and heart disease, an equally compelling case cannot be made for chicken consumption (Messina, 2011).¹⁶ Indeed, the American Cancer Society advises to “choose fish, poultry, or beans as an alternative to red meat (beef, pork, and lamb)” (Kushi et al., 2012). The World Health Organization also recently classified red meat consumption as “probably carcinogenic to humans” (Bouvard et al., 2015, p. 1600). Further, from an environmental position, reductions in beef consumption are thought to hold more promise than reductions in chicken consumption (Eshel, Shepon, Makov, & Milo, 2014, p. 11996; Marlow et al., 2009, p. 1701S).

Given these at times contradictory goals, this research isolates the frame of animal protection as the mechanism by which to assess which of several meat-restricted diets would best support an EAA approach to dietary outreach in the U.S. Bockman best summarizes the motivation for prioritizing animal protection among these worthy topics given the opportunity farmed animal advocacy holds for minimizing the greatest amount of suffering (animal or otherwise). Per Bockman, the suffering of farmed animals is thought to be considerable and farmed animals also far outnumber humans. Worldwide, close to 60 billion animals are used for food annually compared to a total human population of seven billion (Bockman, 2015, pp. 135–136).

The focus on farmed animals also aligns with the effective altruism movement’s priorities. The top areas identified by effective altruists as holding promise for doing the most good are thought to be world poverty, industrial animal agriculture, and the long-

¹⁶ This is not to say that health concerns have not been raised about chicken (Davis, 2015; The Physicians Committee, n.d.).

range future of life on Earth (MacAskill, 2015, p. 12). Bockman further explains the benefits of effective altruists focusing on farmed animals as follows:

a unique characteristic of farm animal advocacy is that it translates into everyone's everyday food choices, causing significant potential flow-through effects. Not only does farm animal advocacy directly lower the demand for animal products (and in turn lower supply), but also each changed individual will likely perpetuate this change through influencing others around them, sometimes without any additional organizational intervention. Lastly, shifting purchasing power away from factory farm products immediately creates new demand — and in turn, supply — for ethical alternatives, reinforcing the change (Bockman, 2015, p. 136).

The focus on animal protection positions this research more specifically within the realm of EAA, a subset of effective altruism. EAAs encompass a segment of farmed animal advocates who wish to reduce suffering in the most impactful ways possible (see for example the work of Peter Singer, Animal Charity Evaluators, and Sentience Politics).

2.2 Social Movement Outcomes

Social movement outcomes research is an area that has traditionally been overlooked in the literature in favour of a treatment of movement development and mobilization (Giugni, 1998, p. 371). The area of social movement outcomes is complex and has been said to be “the most problematic area of inquiry” in the social movement literature (Einwohner, 2001, p. 218). Social movement advocacy is thought to have a variety of outcomes, including cultural, economic, legal, and social, as well as changes on the individual level (Einwohner, 2001, p. 212). While the subject of outcomes is understudied, there has been a consideration of a variety of outcome topics, most noteworthy for this research include: intended versus unintended outcomes, direct versus

indirect outcomes, short versus long-term outcomes, and the definitions of success and failure as well as cultural and social effects.

Giugni's (1998, p. 411) assertion that social movement's goals "may expand in response to initial successes, or contract in the face of failures" is relatable to the animal advocacy movement's dietary outreach initiatives. As the prevalence of vegetarians remains relatively stagnant in the U.S. and the movement's understanding of the problem of lapses from meatless diets grows (Asher et al., 2014b), some are questioning the strategic value of continuing to prioritize the promotion of vegetarian diets. These individuals suspect interim steps like meat reduction (Leenaert, 2015d) or specific types of eliminations (One Step for Animals, n.d.-a) could be more beneficial. This research assesses this considering both short-term and projected long-term outcomes of the animal advocacy movement's dietary outreach.

Giugni explains that social movement's "efforts that are quite unsuccessful in the short run may have big effects in the long [term]" (Giugni, 1998, p. 412). It is possible that a meat reduction message may lead to the consumption of more meat-free meals, which has been said to be a marker of achieving societal change in the longer-term because of its effect on the demand for, and availability of, alternatives as well as its role in increasing social acceptance (Leenaert, 2015a). However, it may be that this messaging will not decrease the consumption of the largest number of animals in the short-term to the same extent as perhaps a chicken avoidance message might, this given the disproportionally large number of chickens used for food in the U.S. (Cooney, 2014, p. 4; Sethu, 2012).

Conversely, it is possible that while the chicken avoidance message may impact a greater number of animals in the short-term than a general meat reduction appeal, it

may result in the consumption of relatively few meat-free meals if other meats are substituted in the place of chicken. Such a scenario may do little to improve the overall supply and quality of plant-based alternatives in the long-term. However, it is a possibility that individuals may substitute chicken with meat-free substitutes (such as plant-based chicken) rather than other types of meat, which would improve the supply and quality of alternatives. In addition, while it is possible that promoting vegetarianism may not result in the largest increase in the number and spread of meatless meals in the short-term, by being persistent with this messaging it could prove to be the quickest way to a critical mass that Rogers (2003) cites as so crucial in the diffusion of innovations, thus yielding the greatest longer-term impacts.

While political outcomes have received considerable treatment in the social movement literature, this research is more in line with the less studied area of cultural outcomes, thought of as: “changes in the values and ideas of the public, the development of new cultural products and practices (for example, popular culture and language), and the formation of collective identity and subcultures” (Bosi & Uba, 2009, pp. 409–410). The sidestepping of the relationship between culture and social movements (e.g., identity and ideology) in favour of a rational political approach has been said to have resulted in a structural bias in the understanding of social movements (McAdam, 1994, p. 36).

One noteworthy cultural focus of this research is the idea of frame alignment processes, where “organizers seek to join the cognitive orientations of individuals with those of social movement organizations,” the success of which is thought to be partly determined by “the *cultural resonance* of the frames advanced by organizers” (McAdam, 1994, p. 37). This relates to this dissertation’s focus on the extent to which

external perceptions differ for the frames under study (i.e., meat reduction and elimination). While this research does not explicitly address the multitude of cultural interpretations and relations with food, it takes the viewpoint that meat consumption is the dominant conventional social practice within North American society and that social movement efforts to alter these practices may have differing levels of impact.

The biographical domain—an additional understudied area with a bearing on this dissertation—centres around “the impact of mobilization on the lives of sympathizers and participants in social movements” (Bosi & Uba, 2009, p. 410). This links to this study’s focus on internal experiences. A related issue is the role that in-person protester/target interactions can have on movement outcomes. Einwohner (2001, pp. 211–212) argues that an examination of such micro-interactions (perched in the realm of microsociology) can reveal a wealth of different possible outcomes (including intended and unintended ones) as well as help establish the immediate causal impacts of protests. An example is identity interactions, where the demographic characteristics (such as gender and class) of social movement activists are said to play a role in how a message is received by targets of advocacy and influences outcomes (Einwohner, 1999, p. 57). This is particularly relevant to this research’s focus on external perceptions, particularly respondents’ attitudes towards those who already adhere to the diets.

Given the inherent complexities, it is important to remember, as Bosi and Uba (2009, p. 409) note, that social movement effects can be wide ranging and so should not be thought of merely in terms of successes and failures. Indeed, because it is a challenge to pinpoint the full set of outcomes that result from social movement activity, it becomes difficult to determine whether advocates have achieved success in overall terms (Einwohner, 2001, p. 212). Some scholars have even opted to set aside words such as

“success” in favour of a focus on “impacts” or “target responsiveness” when discussing outcomes (R. L. Einwohner, 2001, p. 212).

Adding complication is the fact that different views exist regarding what outcomes are beneficial for a movement (Einwohner, 2001, p. 212). This is a topic that is familiar to farmed animal advocates given the opposing viewpoints on vegetarianism and meat reduction within this social movement. This research recognizes that predicting social movement outcomes is a difficult endeavour, that claims of causality can be misleading, and that “social change may move with, or against, the movement objectives, and effect the movement in unexpected way” (Bosi & Uba, 2009, p. 410).

2.3 Sociology of Food

Food habits are social constructions and because they are subjective creations about what is culturally appropriate to consume (Germov & Williams, 2008, p. 4), they are amenable to change. To be effective, a dietary intervention must be designed with an awareness that—in addition to the requirements of the body—the consumption of food is used to satisfy a host of socially determined needs and “when humans eat, they eat with the mind as much as with the mouth” (Beardsworth & Keil, 1997, p. 52).

One key aspect of the sociology of food is understanding how social change in dietary patterns occurs and the role of habit in food decision-making. As Singer notes, “behind the mere momentary desire to eat meat on a particular occasion lie many years of habitual meat-eating which have conditioned our attitudes” (1990, p. v). While food habits were at one time thought to be impenetrable, today the pace with which they are diversifying is remarkable (Mennell, 2008, p. 258). Modern Western societies with their

“menu pluralism” are thought to offer particularly hospitable conditions for such change (Beardsworth & Keil, 1997).

Vegetarianism, the most limiting of the three diets under study, falls “outside of the accepted eating patterns in Western nations” and is even said to be “a form of positive deviance” (Boyle, 2011, p. 314). Being positioned outside of the mainstream is challenging when it comes to eating, given that it is a daily and inherently social activity (Paisley, Beanlands, Goldman, Evers, & Chappell, 2008, p. 80). As Paisley et al., note: “from a sociological perspective, food choice is understood as a dynamic, social phenomenon, rather than an individual phenomenon” (2008, p. 80). Because of the way food consumption is woven into our social fabric, Boyle explains that “those who practice vegetarianism must negotiate their decision to participate in behavior outside the norm in similar ways to other people who engage in alternative behaviors” (2011, p. 329). An understanding of food consumption as a sociological phenomenon is a key tenet of this research.

Given that eating is not only an individual endeavour but a social activity (Paisley et al., 2008, p. 80), it is understandable that social influences impact the outcome of attempts at dietary change (Haverstock & Forgays, 2012, p. 1030). This is examined in this study, including in relation to food opinion leaders, i.e., those who shape others’ attitudes and choices around food. An assessment of food opinion leaders in various dietary segments of the population is offered to provide insights into the potential multiplier effect this group may have and the relevancy this could hold for effective advocacy.

Family members have been shown to serve a pivotal role in the success of dietary modifications (Paisley et al., 2008, p. 80). In her article on veganism and

vegetarianism, Greenebaum notes that “the dinner table can be a place that creates warmth and positive memories, or it can be a space for division—a battlefield for family drama” (2012a, pp. 322–323). Indeed, research has highlighted that families may be opposed to another family member’s adoption of a meat-free diet (Beardsworth & Keil, 1997, p. 235; Hirschler, 2011, p. 162; Jabs, Devine, & Sobal, 1998, p. 186; Jabs, Sobal, & Devine, 2000, pp. 383 & 389; McDonald, 2000, p. 12; Roth, 2005, pp. 183, 187–188, 194 & 197). Though, this is not always the case (Beardsworth & Keil, 1997, p. 235; Hirschler, 2011, p. 162; Roth, 2005, pp. 196–197). Food also plays a role in romantic relationships. If one partner attempts to change their diet, the other can have a notable impact on the process, including for vegetarians (Paisley et al., 2008, pp. 80, 83–84).

The sociology of food offers a solid theoretical grounding to analyze the social determinants of the adoption, maintenance, and rejection of meat-free and meat-reduced diets (Beardsworth & Keil, 1992; Fox & Ward, 2008; Haverstock & Forgays, 2012). This is particularly relevant for this research’s focus on external perceptions (views about the diet from those not currently restricting their meat consumption) and internal experiences (lived understandings from those currently eating one of the meat-restricted diets). Within sociology of food lies a variety of topics including family food habits, social relationships, identity, culture, class, the masculinity of meat, food norms, stigma, time famine, fat shaming, race, education, socioeconomic status, and access to food (Beardsworth & Keil, 1997; Germov & Williams, 2008; Jabs et al., 2000; Murcott, 1995; Paisley et al., 2008; Ruby & Heine, 2011; Slater, Sevenhuysen, Edginton, & O’Neil, 2012; Slocum, 2010).

There are many topics of note from within the sociology of food for this research including SWFL, which relates to the extent to which food and meals are perceived as

positive or negative elements in one's daily life. This aspect of an individual's food life speaks to the fact that eating goes beyond a simple exercise in meeting nutritional requirements by extending into the area of food satisfaction as broadly understood.

This research also examines the interplay between social connections and dietary behaviour. Specifically, it queries whether individuals have strong and extensive ties to people who eat meat-restricted diets, something that is used to assess food norms and levels of social support. Similarly, this dissertation addresses the degree to which meat-restriction creates issues in one's social and personal life. It also examines to what extent the important people in one's life think they should eat a meat-restricted diet and relatedly the degree to which individuals are motivated to eat what the important people in their life think they should. On the topic of food norms, the dissertation assesses the discrepancy between perceptions versus reality when it comes to the prevalence rates of various meat-restricted diets, which is used as an indicator for whether restricting meat consumption is believed to be more or less "normal" than it is. These research directions, which examine social connections and dietary behaviour, speak to the fact that food consumption is intimately woven into the social fabric of our lives, which is a key pillar of the sociology of food.

This research also examines the role of stigma as it relates to dietary choices. More specifically, it utilizes an attitude thermometer to measure feelings towards those who eat a meat-restricted diet, which denotes the extent to which such dietary groups are viewed as marginalized. Finally, this dissertation examines social and internal forces that can act as benefits or barriers to dietary choices and impact the ways in which individuals use food to satisfy a host of socially determined needs. Some of the more relevant topics touched on in this research that relate to this aspect of the sociology of

food include whether meat-restricted diets are believed to be inconvenient or costly as well as whether they encompass an identity piece. This research explores how these specific areas can play into the social determinants of the adoption, maintenance, and rejection of meat-restricted diets.

2.4 Dietary Behaviour Change

This dissertation draws on a few major theories of behaviour change. One is the TTM SOC, which assesses various stages of change including both cognitive (precontemplation, contemplation, preparation) and behavioural stages (action and maintenance). Originally developed by DiClemente and Prochaska (1982) for use in addiction work in clinical settings (Povey, Conner, Sparks, James, & Shepherd, 1999, p. 641), the model has been employed in a variety of fields and non-clinical contexts (Bridle et al., 2005, pp. 283–284; Di Noia & Prochaska, 2010, p. 618; Povey et al., 1999, p. 642). It has also increasingly been used for dietary interventions (Wyker & Davison, 2010, p. 169) and has been shown to be useful for determining the extent of a population's readiness to reduce their meat consumption (Tobler, Visschers, & Siegrist, 2011) and to consume a plant-based diet (Lea, Crawford, & Worsley, 2006a, p. 348).

Another prevalent theory of behaviour change that informs this work is the TPB. This theory, put forth by Ajzen and Fishbein in the 1980s, “explains attitude-behavior relationships, focusing on the relationship between the strength of our behavioral intentions and our performance of them” (Bordens & Horowitz, 2001, p. 199). Under this theory, the probability that an individual will engage in a behaviour that is aligned with an attitude is related to how strong their intention is, which can be predicted in three ways: attitude toward the behaviour, perceived behavioural control, and subjective

norms (Bordens & Horowitz, 2001, pp. 199–200). As Bordens and Horowitz explain, “by measuring these factors, we can determine the strength of intention, which enables us to predict the likelihood of the behavior” (2001, p. 199). Researchers have used this theory to determine which variables predict intentions to continue to adhere to a vegetarian diet (Cron & Pobocik, 2013, p. A-90).

Though not used directly in the results or discussion sections herein, the foot-in-the-door technique is a behaviour change theory coming from the field of social psychology that relates to this area of study. It is connected to social compliance and maintains that getting an individual to agree to a request is easier if they have subsequently agreed to a related lesser request (Burger, 1999, p. 303). Farmed animal advocates have cited this approach as being of relevance for their outreach (Cooney, 2011) and meat reduction has been said to pave the way for vegetarianism (Mercy for Animals, n.d.). A competing social psychology theory, the door-in-the-face technique, is based on the idea that, “if you want to make a request of someone but you’re worried that they might say no, get them to say no to a larger request first” (Sagarin, 2007, p. 262). This theory may support the idea that a vegetarian appeal could lead to meat reduction efforts.

The purpose of bringing the TTM SOC and the TPB into this work is to inform variable selection rather than to specifically test these theories. Referencing these theories establishes that the variables were not a random selection of measures uninformed in some way by the existing literature and devoid of a theoretical frame. The objective with the TPB, for example, was to examine how each diet *performed* on the theory’s four separate items, which were chosen because they had a basis in the literature. The TPB is used in this dissertation to frame the discussion, rather than to test

the theory's validity. However, it is recognized that in addition to describing the findings for each item on its own as has been done here, many scholars also routinely look at the interplay between the TPB variables and test hypotheses that imply a causal order. Approaching these theories in a conventional fashion analytically would have shifted the focus away from the EAA-informed research questions and toward an analysis of the mechanisms of dietary behaviour change, something that goes beyond the scope of this study.

2.5 Research Inquiry

Traditionally, the animal advocacy movement has advocated meat abstention. Yet there is the increasing question of whether promoting vegetarianism is the most expeditious way to achieve the movement's goal of decreasing society's reliance on meat and farmed animals (Doebel, Gabriel, & The Humane League, 2015; Fischer & McWilliams, 2015; Leenaert, 2015d; Mercy for Animals, n.d.). One reason to question the benefit of advocating for abstention is that the proportion of vegetarians and vegans in the U.S. has remained relatively stagnant over the years. As Table 1 shows, there has been a very modest increase in those eating meatless diets over the past two decades. Indeed, given the margins of error, the differences may not even be practically meaningful.

Table 1. The Vegetarian Resource Group Polls with U.S. Adults 18+ years

	'94	'97	'00	'03	'06	'09	'11	'12	'15	'16
Proportion of population that never eats meat (including poultry, fish, and seafood)	0.3 to 1%	1%	3%	5%	4%	3%	5%	4%	3%	3%

(Stahler, 1994, 2006, 2011, 2012, 2015, The Vegetarian Resource Group, 1997, 2000, 2003, 2009, 2016)¹⁷

A recent estimate using a large sample size and several safeguards to limit over-reporting of meat-free eating estimated that vegetarians and vegans comprise roughly 2% of the population 17 years and older (Asher et al., 2014b). Thus, regardless of the change over time, the current rate of meat-free diets covers an incredibly small percentage of the population. In contrast, the proportion of people who report reducing their meat consumption is much larger. Some estimates indicate approximately a quarter (26%) of American adults report eating less meat (Faunalytics, 2007, p. 5), while others suggest a third (33%) of U.S. adults eat meatless meals with a frequency somewhere between one meal per week and at more than half their meals (Stahler, 2015). Likewise, more than a third (36%) of American consumers report eating meat alternatives (Mintel, 2013). Some studies suggest that there are roughly four times the number of individuals reducing their meat consumption as those who have eliminated it (Cooney, 2014, p. 28). With such a large proportion of American adults reporting that they are reducing their meat consumption, meat reducers are an important and under-studied segment of the population.

Cooney (2014) and others credit meat reducers with fuelling the drop in per capita meat consumption in the U.S., which is down from the peak in 2004 (see Table 2). Reducers are also said to have prompted the drop in the number of land-based farmed animals slaughtered in 2014 as compared to 2007 (Sentenac, 2015a). However, a notable

¹⁷ It is important to use caution in interpreting the results given the different methodologies used for the polls.

part of the decrease in the number of farmed animals—at least when comparing 2008 (the peak year) to 2015—could be due to the breeding of higher-weight animals. Consider that in 2015 there were more than 250 million fewer chickens slaughtered than in 2008, yet per capita chicken consumption was 5.1 lbs higher (see Table 2).¹⁸ However, farmed animals (notably chickens) have been increasing in weight for many decades (Sethu, 2013), so other factors outside of animal size are likely also at play.

Table 2. U.S. Per Capita Meat Consumption and Farmed Animal Slaughter Totals

	Animals slaughtered (cows, chickens, ducks, pigs, sheep & lambs, and turkeys) (000s)	Per capita meat consumption (beef, pork, chicken, and turkey) (lbs)	Chickens slaughtered (000s)	Per capita chicken consumption (lbs)
2004	9,315,382	221.9	8,895,748	85.5
2005	9,415,449	221.2	9,000,473	87.3
2006	9,392,864	221.7	8,968,666	87.9
2007	9,473,987	221.7	9,035,620	86.4
2008	9,524,028	216.0	9,075,261	84.9
2009	9,076,867	210.8	8,658,860	81.1
2010	9,203,691	208.9	8,790,478	83.8
2011	9,101,494	204.5	8,683,067	84.3
2012	8,998,866	202.1	8,576,194	81.8
2013	9,059,615	203.5	8,648,756	83.1
2014	9,069,002	202.0	8,666,662	84.6
2015	9,229,243	210.8	8,822,695	90.0

(National Chicken Council, n.d.; The Humane Society of the United States, 2015)

In addition to the difference between the number of current meat reducers and eliminators, there is also a notable imbalance in the public’s willingness to adopt these diets. The proportion of U.S. adults who say they are willing to cut their meat

¹⁸ This does not factor in imports, exports, or mortality rates.

consumption by half (24%) is over three times the rate of those who are open to eliminating meat altogether (7%) (Faunalytics, 2007, p. 5). Additionally, the extremely high proportion (84%) of vegetarians/vegans who lapse from their diet (Asher et al., 2014b, p. 4) also raises questions about the value of advocating vegetarianism.

The above indicators seem to suggest the benefit from an effective altruistic standpoint of promoting that “the many” reduce their meat consumption rather than encouraging “the few” to achieve total elimination. There is some muddying of the waters, however. Compared to the average U.S. adult, former vegetarians and vegans appear to be best conceptualized as meat reducers or potentially even semi-vegetarians given that they consume half as much meat as the average American (Asher et al., 2016).¹⁹ This suggests that even with low retention rates, there may still be a longer-term meat reduction benefit of creating (temporary) vegetarians.

Furthermore, vegetarian campaigns are unlikely to only inspire moves to vegetarianism. Some meat abstention campaigns result in individuals opting to reduce their meat consumption despite being called on to eliminate it (Doebel et al., 2015). Further, as shown in Table 3, there is evidence suggesting that the proportion of meat reducers is not increasing and may even be decreasing.²⁰

¹⁹ It is not known, however, whether this represents a decrease in meat consumption from their pre-vegetarian/vegan diet days.

²⁰ Because the scale in Table 3 is not continuous, it is possible that there are other data points that could change the outcome. Given that different methodologies were used for the polls, caution should be used in interpreting the results.

Table 3. The Vegetarian Resource Group’s Polls with U.S. Adults 18+ years

	2011	2012	2015
Do not eat meat (including poultry, fish, and seafood) at one meal per week	6%	7%	8%
Do not eat meat (including poultry, fish, and seafood) one full day per week	4%	7%	5%
Do not eat meat (including poultry, fish, and seafood) at many meals, but less than half the time	17%	15%	10%
Do not eat meat (including poultry, fish, and seafood) at more than half of meals, but not all the time	16%	14%	10%
Total	43%	43%	33%

(The Vegetarian Resource Group, n.d.)

Additionally, even a modest increase in vegetarianism could have a high impact given that these individuals completely eschew meat. For example, increasing the number of vegetarians in the U.S. by just 1% of the American population would result in an increase of 3.2 million vegetarians.²¹ This would amount to close to an additional 70,000 meatless meals a week (assuming 21 meals weekly). Trying to achieve the same number of meatless meals through an initiative like Meatless Monday would require the participation of 22.4 million Americans. Under such a scenario, it could be argued that if the number of Americans who are open to restricting their meat consumption in some fashion is limited, it may be more impactful to make a bigger request of this segment of the population.

Meat reduction efforts have also been criticized for doing little to foster change. The parameters are said to be too abstract, and there are concerns that individuals will erroneously assume they already consume a reduced-meat diet and so have no reason to make further adjustments (Matt Ball as quoted in Leenaert, 2015c). Some meat

²¹ Assuming a U.S. population of approximately 324 million in the early months of 2017 (United States Census Bureau, 2017).

reduction initiatives provide more tangible guidance, such as Mark Bittman's Vegan Before 6:00 or the Meatless Monday campaign. However, they could be critiqued for not encouraging individuals to implement sufficient dietary modifications or for being so self-contained that they offer no motivation to broaden beyond these specific changes.

Meat reduction has also been heavily criticized by the abolitionist segment of the animal advocacy movement for what they say is its unethical stance. A key voice belongs to Gary Francione who has said in response to assertions that reducing one's meat consumption is beneficial for animals that "telling people that eating less meat allows them to discharge their moral obligations to animals is as morally obscene as having a campaign that promotes the idea that 'Raping fewer women is good for the well-being of women' " (Francione, 2015). Others are concerned that reduction strategies depict veganism as "difficult, puritanical, elitist" (McCormack & O'Reilly, 2016). Some have leveled criticisms on reduction efforts by asking "what could make veganism appear more difficult than the insistence by vegans that it is? What could be more puritanical than the depiction of veganism as beyond the moral scope of even those who care?" (McCormack & O'Reilly, 2016).

Taft (2015) also uses a pro-vegan lens and rejects the use of meat reduction as a dietary outreach strategy because he believes there is no "published science (or even unpublished research that I'm aware of) indicating that this is more effective." Further, Taft says there is evidence to the contrary based on "what clinical psychologists have long known about how to promote true behavior change" (2015), which is that there needs to be a clear goal (i.e., veganism) that is "defined and conveyed absolutely and unapologetically" (2014).

Meat reduction is further condemned on health grounds for the possibility it creates for reducers to replace their consumption of beef or pork with chicken or fish. There is, however, conflicting information on whether this occurs (Cooney, 2014, pp. 108–110). If it does, this would be problematic from an animal protection standpoint as it would result in the consumption of more farmed animals as a greater number of chickens and fishes are needed to produce the same quantity of meat from cows and pigs. As Messina (2011) explains:

Assuming that one steer provides around 450 pounds of meat, a person eating a pound of beef per week would be responsible for the death of one steer every 8 ½ years or so. Replace that pound of beef a week with a pound of chicken (assuming that the average chicken yields 2 pounds of meat) and the number of animals killed would be about 220 chickens over the same time period.

Conversely, decreases to the amount of chicken consumed in the U.S. could have a sizeable impact. Cooney explains:

“A person who gives up eating chickens entirely—even if they replace all of the chicken they used to eat with beef and pork—will spare 27 to 28 animals. If the entire country did that, the number of farm animals killed each year in the U.S. would drop from about 8.5 billion to 1 billion—even though Americans will be eating as much meat as they did before” (2014, p. 5).

Chickens, therefore, problematize the conversation by serving as a dominant factor in any assessment that uses the number of farmed animals as a metric for gauging effectiveness given that in 2012 the average U.S. omnivore ate 28 chickens compared to a half a pig and an eighth of a cow (Cooney, 2014, p. 4). Over the years, the popularity of chicken in America has far outpaced that of red meat. Compared to dietary patterns in the early 1900s, individuals in the U.S. are consuming only marginally more red meat, but seven times more chicken (Cooney, 2014, p. 97).

Concerns about smaller-bodied animals have been recognized for some time. As early as the 1990s, Singer cautioned against consuming mollusks even given the scientific uncertainty about their ability to experience pain, because if they could “a meal of oysters or mussels would inflict pain on a considerable number of creatures” (1990, p. 174). More recently, others have addressed the matter. MacClellan has argued that “animal size is a relevant and unappreciated consideration in moral evaluations of killing animals for food, especially for utilitarians” (2013, p. 57). He draws specific attention to chickens noting that they are “the paradigmatic small animal used for food in the United States” (MacClellan, 2013, p. 59). Effective altruists such as Tomasik (2007) have noted that “eating certain types of meat may cause more suffering than eating the same amount of another type of meat under otherwise identical circumstances.”

Advocates have also been conducting outreach on this issue for a while. PETA’s 2001 “Eat The Whales” campaign urged individuals unwilling to adopt a meat-free diet to consider meat from larger animals such as whales instead of smaller ones like chicken and fish to make a point about how to reduce overall suffering (People for the Ethical Treatment of Animals, 2001). Many advocacy organizations have also altered their campaign material to feature chickens or fishes more prominently. Vegan Outreach’s booklet “Your Choice,” offers a discussion of how many chickens an individual can impact in comparison to other farmed animals and gives fishes a prominent place (Vegan Outreach, n.d.). Mercy for Animals also has a page dedicated to explaining “how switching to chicken hurts more animals” because of size considerations and degree of suffering (Von Alt, 2015).

However, it was not until recently that a standalone effort began addressing the disproportionate number of chickens used in animal agriculture. The One Step for Animals initiative promotes the elimination of chicken on ethical grounds as a single step that can dramatically decrease how many farmed animals a person consumes. Campaign organizers note that “if we can convince someone to stop eating birds, they would go from being responsible for the factory farming and slaughtering of more than two dozen land animals per year to *fewer than one*” (One Step for Animals, n.d.-b).

Organizers credit the One Step position with providing a dietary option that is easier to implement than vegetarianism, while also specifying tangible goals (unlike general appeals for meat reduction). Perhaps to its disadvantage is the finding that most individuals on, or willing to adopt, a reduced-meat diet are primarily motivated by health concerns. As a consequence, leading with an animal protection message that promises little to no health benefit (Messina, 2011) may not result in substantial uptake. Nevertheless, even if a relatively small proportion of individuals were willing to eliminate chicken from their diet (or even to reduce their chicken consumption), this could still be a high return campaign given the sizable impact even a small move on this front could have.

A further complicating factor in assessing what type of dietary recommendation is the most impactful is determining what metric(s) to use to measure efficacy. There are many potential avenues including changes to societal attitudes towards farmed animals, total meat consumption, the number of farmed animals consumed, the extent or degree of suffering experienced, the number of meat-free meals eaten, the percent of the population consuming meat-free meals, etc.

There is also a question about what the individual experience is over time for these different diets, especially given that society is organized predominantly counter to meat-restricted diets. There is an in-depth understanding of the experiences of vegetarians (Asher et al., 2014b; Asher & Cherry, 2015; Cherry, 2015; Cooney, 2014; Hirschler, 2011; Jabs et al., 2000; Ruby, 2012). However, far less is known about the experiences of meat reducers and next to nothing is known about the experiences of omnivores who eschew chicken (particularly non-pescetarians), nor about how these diets compare to one another. A further question is how individuals who are not restricting their meat consumption perceive those currently eating this way and whether one diet is considered more desirable than the others. Omnivores' perceptions of vegetarians have some basis in the literature (Chin, Fisak, & Sims, 2002; Cole & Morgan, 2011; MacInnis & Hodson, 2015; Povey, Wellens, & Conner, 2001; Twine, 2014), though not much is known about how meat reducers and chicken avoiders are perceived.

While this discussion has problematized the question of how to realize advocates' desired social movement outcomes in American society around meat and farmed animals, the findings from this research will begin to bring some clarity to this issue. To do so, this research draws on the field of applied sociology, which uses sociological methods and inquiry to answer real-world social problems.

2.6 Concluding Summary

This chapter addressed the dissertation's positioning at the intersection of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change. There was a discussion of how "doing good better" was framed using an animal

protection lens. The literature on social movement outcomes was examined and the specific areas of relevance for this research were discussed, including short-term and projected long-term outcomes as well as cultural effects. The chapter also considered why the sociology of food offers a solid theoretical grounding for analyzing the social determinants of the adoption, maintenance, and rejection of meat-free and meat-reduced diets. There was a discussion of the major theories of behaviour change considered in this research including the TTM SOC and the TPB. Finally, this chapter unpacked the research problem of vegetarianism versus meat reduction as well as the issue of smaller-bodied animals.

3.0 METHODS

This chapter discusses the methods used in this dissertation, which involved collecting data on the Qualtrics platform from an online census-balanced cross-sectional sample of more than 30,000 U.S. adults 18+ years of age provided by Nielsen in the fall of 2016. Six groups of respondents were isolated in this sample: American adults who ate one of three meat-restricted diets (vegetarians, meat reducers, and chicken avoiders), and American adults who were not restricting their meat consumption (i.e., non-reducing omnivores²²) who were randomized into one of three survey paths (non-reducing omnivores asked about a vegetarian diet, non-reducing omnivores asked about a reduced-meat diet, and non-reducing omnivores asked about a chicken-free diet). These paths allowed for an exploration of both external perceptions of the diets as well as lived experiences. Surveying meat restrictors permitted current impacts to be assessed and surveying non-restrictors allowed projections to be made about future potential impacts based on non-reducing omnivores' adoption intentions.

The chapter begins with background information including how the three diets under study were defined for non-reducing omnivores as well as the verification process used to classify individuals as eating one of these diets. There is a discussion of the study design including its cross-sectional format and the specifics of administering a web survey. The use of sample size projections ahead of data collection is addressed along with the procedure used to secure participants. The experimental component of the

²² The term non-reducing omnivores is used as a shorthand for individuals not restricting their meat consumption per one of the three diets under study. Such respondents are also referred to herein as those “not restricting their meat consumption.”

data collection (owing to the randomization of non-reducing omnivores into different diet paths) is explained along with the programming on the Qualtrics platform, including randomization, the survey's look and feel, features, and testing.

There is also a discussion of study materials with details on question wording and attention checks as well as the treatment of multi-item measures. Each of the measures used in the study is reviewed in turn including their purpose, their basis in the literature, the response scale used, and the results of reliability testing when applicable. There is an explanation of the process of securing external feedback on the study design, pilot testing (using cognitive interviewing and field testing), and the ethical protocols.

Given the large sample size and the complexity of the survey instrument, data collection involved many decisions and real-time attention, which is enumerated in detail in this chapter. Examples include quality control, incidence rate (IR) checks, sampling, router prioritization, invitations, census-balancing, response rates, randomization, quotas, and the specifics of the soft and full launch. The data analysis process is also described including pre-analysis planning, the statistical software package, the weighting procedure, data cleaning and coding, dataset iterations, population estimates, and the justification and limitations of using independent one-way ANOVAs and pairwise comparisons as the principal statistical test for the external perceptions and internal experiences sections.

3.1 Research Questions

One main research question guides this research: *Which of several meat-restricted diets (a vegetarian diet, a reduced-meat diet, or a chicken-free diet) would best support an EAA approach to dietary outreach in the U.S.?* This question is answered by exploring

eight research questions (included below), most of which also have nested research questions, which can be found in Appendix A – Research Questions.

1. Prevalence and Opinion Leaders (Current Impact): Which of the three diets has the highest prevalence rate among American adults and the highest number of food opinion leaders based on current eating patterns?
2. Prevalence and Opinion Leaders (Future Potential Impact): Which of the three diets is projected to have the highest prevalence rate among American adults and the highest number of food opinion leaders based on future potential eating patterns?
3. Meat-Free Meals (Current Impact): Which of the three diets results in the largest number of meat-free meals eaten each week and the largest number of American adults this is spread amongst based on current eating patterns?
4. Meat-Free Meals (Future Potential Impact): Which of the three diets is projected to result in the largest number of meat-free meals eaten each week and the largest number of American adults this is spread amongst based on future potential eating patterns?
5. Farmed Animals (Current Impact): Which of the three diets removes the largest number of land-based farmed animals raised for meat from the food stream based on American adults' current eating patterns?
6. Farmed Animals (Future Potential Impact): Which of the three diets is projected to remove the largest number of land-based farmed animals raised for meat from the food stream based on American adults' future potential eating patterns?

7. External Perceptions (Future Potential Impact): Which of the three diets has the best external perceptions among American adults who are not currently restricting their meat consumption?
8. Internal Experiences (Current Impact): Which of the three diets has the best internal experiences among American adults who are currently eating one of these meat-restricted diets?

These indicators feed into the overarching question of which of several meat-restricted diets would best support an EAA approach to dietary outreach. There is an emphasis on both current and future potential impact because of the importance of understanding the tangible effects being realized now as well as projections for change given effective altruism's interest in the far future. Examining both is important given the current uncertainty in EAA about whether more weight should be given to long-term or short-term outcomes (Sentience Institute, 2017). Prevalence rates were selected because they are a common metric discussed in EAA, including food-based animal advocacy—see for example Faunalytics (2010). The proportion of opinion leaders is a useful metric as per Rogers' (2003) work on the diffusion of innovations as well as effective altruism's interest in the far future (Muehlhauser, 2015, p. 103; Sentience Politics, n.d.).

The work of Leenaert (2017), who often writes from an EAA perspective, was the motivation for the focus on meat-free meals—in contrast to solely meat-free individuals—and the importance of the “spread” of such eating patterns. The number of land-based farmed animals raised for meat removed from the food stream has been cited as one of the key metrics for assessing the efficacy of farmed animal advocacy (Animal Charity Evaluators, 2016a; Cooney, 2014, p. 5). How the external perceptions of the

three diets differ was chosen because adoption potential and barriers are a movement focus (Cooney, 2014, p. 81; Faunalytics, 2007). Lived experiences was also selected because movement research has increasingly become concerned with diet maintenance (Asher et al., 2014b).

3.2 Diet Groups

The three diets under study were defined for non-reducing omnivores in the survey as follows:

1. Vegetarian diet – a diet that does not include any meat i.e., one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats. A vegan diet is also included in this definition because it is also meat-free.
2. Reduced-meat diet – followed by people who are reducing the total amount of meat they eat compared to a past diet. This does not include a vegetarian/vegan diet. The term “meat” includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.²³
3. Chicken-free diet – a diet that excludes chicken but does include meat of some kind, i.e., includes beef, pork, turkey, fish, shellfish, and/or other meats. Based on findings from the cognitive interview, this definition was repeated during the survey as a reminder for participants.

When possible, a two-step verification process was used to classify individuals as currently eating one of these diets. These confirmation procedures were used to avoid

²³ This definition did not specify that meat reducers had to eat chicken—even though this is how the diet was operationalized for current reducers—because it was thought to add more confusion than benefit. This presents a limitation.

respondent burden given that for the remainder of the survey individuals were asked about the specific diet and, if they misclassified themselves as belonging to that diet group, they would not be able to proceed properly in the survey. It was also used to ensure a more accurate assignment to the dietary groups given that past research has shown this type of verification to be necessary. For example, Asher et al., (2014a) found that unverified vegetarians account for 3.7% of U.S. population 17+ years when using a food list, while verified vegetarians (who also self-identify with the vegetarian label) are a smaller segment at 1.9%. Having respondents solely self-identify with the label can lead to overestimates where individuals who consume meat are included among vegetarians (Juan, Yamini, & Britten, 2015, p. 86). This over-reporting of adherence to vegetarianism is interesting given that research has also shown that when used for meat-free products, the term vegetarian “has a negative effect on how the consumer perceives the food” (Ball, 2015b, p. 12).

3.2.1 Meat Reducers

Meat reducers had to first indicate that they ate at least one type of meat in the food frequency questionnaire (FFQ) before being asked whether they were currently reducing the total amount of meat they eat compared to a past diet. Respondents were asked to self-identify as meat reducers rather than basing this on self-reported food consumption because it was not practically feasible to collect pre-reduction consumption data. Likewise, the self-identification was used because meat reduction was operationalized as a diet that differs from a past one given that this was thought to indicate a commitment to the diet—of interest for these purposes—rather than simply consuming less than a certain threshold. Other studies have, however, classified meat reducers according to

such a threshold (Ball, 2015b, p. 8). Another reason for this approach was that respondents had to identify with the label to be able to proceed correctly with the survey.

The verification question inquired about a “past diet” rather than the “previous diet” to allow that the transition may not have been linear. A timeframe was not put on the period of reduction (e.g., in the last 12 months) to avoid an undercount that would fail to identify as reducers anyone who had been reducing for a longer period. Meat reducers were said to be individuals who eat *less* meat in terms of total amounts, rather than those who eat different types of meat (e.g., substituting chicken or fish for red meat). An additional verification process for meat reducers was not used because there was no easy confirmation process given the nature of the definition used. This in turn may have inflated the numbers.

3.2.2 Vegetarians

Vegetarians first had to indicate that they ate no meat in the FFQ and then confirm that they were currently on a vegetarian or vegan diet in a separate question. The term vegetarian in this study also includes vegans, which was made explicit to both current vegetarians and vegans as well as non-reducing omnivores who followed the vegetarian path. For the former, the term vegan was also specified when needed. For non-reducing omnivores, “vegetarian” and “vegan” were collapsed to keep the language concise for simplicity sake, and because some studies suggest veganism is viewed more negatively than vegetarianism (Ball, 2015b; MacInnis & Hodson, 2015; Mercy for Animals, n.d.; Povey et al., 2001) and the goal was to avoid having this unnecessarily cloud the category.

3.2.3 *Chicken Avoiders*

Chicken avoiders first had to indicate that they did not eat chicken in the FFQ and then confirm so in a separate question. Note that individuals who do not eat chicken were classified as chicken avoiders before being given the opportunity to identify as a meat reducer, and so the way these groups are operationalized for purposes of the study allows that chicken avoiders are/could be a specific type of meat reducer, potentially resulted in an undercount of meat reducers. However, given the small proportion of chicken avoiders in the U.S. adult population, if it has done so it is not by much.

3.2.4 *Non-Reducing Omnivores*

Non-reducing omnivores first had to indicate that they ate at least one type of meat in the food list (one of which had to be chicken) and then confirm that they were not currently reducing their meat consumption in a separate question. A verification process was used for non-reducing omnivores who were to follow the vegetarian or chicken avoidance paths to ensure respondents did not erroneously identify as not being part of one of these diets groups as they would have been asked questions about a diet they already followed for the remainder of the survey. The verification for meat reducers was already built-in.

3.3 Study Design

Data collection was carried out by administering an online survey to a cross-sectional census-balanced sample of the U.S. adult population sourced through Nielsen’s Harris Panel (including members of its third-party panel providers).²⁴

3.3.1 Cross-Sectional Design

This study uses a cross-sectional design, which is one where “a single measurement is made on a sample of individuals at a single time point” (Sikkel & Hoogendoorn, 2008, p. 498). Cross-sectional studies are known as observational studies—because they involve observation rather than intervention—and they are typically used to measure prevalence rates (Mann, 2003, p. 54), something of keen interest in this research. Data is collected once (using surveys or interviews) and prevalence rates are considered “the number of cases in a population at a given point in time” (Mann, 2003, p. 55).

While these types of studies are relatively expedient and economical to administer, the data can only establish associations and so cannot distinguish between cause and effect (Mann, 2003, pp. 54–55), though it can be used to infer this (Mann, 2003, p. 55). Such data is useful for making generalization given that results from “population-based cross-sectional surveys can be generalized to the base population for that survey” (Prince, 1998, p. 273).

As was done for this research, cross-sectional studies can be administered on a pool of online respondents managed by a data collection company. This study is based

²⁴ Note that Nielsen was not responsible for any survey design, data analysis, or reporting.

on data from an online panel survey.²⁵ A sample representative of a larger population (e.g., a specific region) can thus be extracted from the larger pool, where quotas are used to “ensure the sample is representative of the age, sex, and social class structure of the population being studied” (Mann, 2003, p. 55).

3.3.2 Web Surveys

This research used an online web survey design. There are three main types of online surveys: ad hoc surveys (i.e., respondents are intercepted while otherwise surfing the web), online panel surveys (as discussed above), and list-based surveys (where the respondents are already identified) (Göriz, 2006, pp. 59–60). A variety of studies have compared the administration of surveys online to those in other mediums and have found the choice to be neutral or a slight preference for the online iteration (Harkness, 2008, p. 75).

One advantage of web surveys is the ability to build in interactive help functions to clarify points of confusion (Falomir, Arregui, Madueño, Corella, & Coltell, 2012, pp. 970–971). Web surveys also remove the need to enter data manually and once the interface has been established, administration to a large and geographically diverse sample is not prohibitive (Falomir et al., 2012, pp. 968 & 970–971). Cost savings, faster response time, the inclusion of skip patterns to direct respondents away from irrelevant questions, and improved data quality (e.g., fewer omitted answers) are other advantages of online surveys (Hoonakker & Carayon, 2009, pp. 350–351). Surveys administered

²⁵ This should not be confused with the use of the term panel to refer to longitudinal data collection consisting of a number of cross-sectional elements.

online also allow questions to be customized based on answers to previous questions, as well as order randomization (of questions, responses, etc.), edit checks, fills, and other features of complex questionnaires (Tourangeau, Conrad, & Couper, 2013, pp. 59–60 & 131–149). Online surveys also permit a response requirement, i.e., when participants are required to select a response before proceeding (Tourangeau et al., 2013, pp. 59–60 & 63–65).

Internet-based surveys' interactivity can also be harnessed to limit breakoffs and increase response accuracy (Tourangeau et al., 2013, p. 100). It is possible in an online survey to provide further details on a question or to offer definitions for main terms, particularly if a participant has been inactive for a set period (Tourangeau et al., 2013, pp. 99–100). Interactivity is also helpful for slowing down “speeders”—those who answer in less time than the time needed to read the question let alone to give it sufficient thought. Prompts that discourage unreasonably fast responses have been shown to result in increased overall response time as well as less “straightlining” on subsequent grids (Tourangeau et al., 2013, pp. 119–120 & 170). Straightlining occurs when participants select the same response option for all items in a grid (Tourangeau et al., 2013, pp. 113–114 & 119–120), and often indicates inattentiveness.

Web surveys are not without their disadvantages. Issues of coverage can be a source of error (Hoonakker & Carayon, 2009, pp. 351–352), referred to as coverage bias (Harkness, 2008, p. 72). This occurs even in wealthy countries such as the United States (Tourangeau et al., 2013, p. 153) when certain sub-groups in the general population lack access to the Internet and consequently cannot become part of the sample. This is particularly acute for those with lower levels of education, the elderly, individuals living in low income (Harkness, 2008, p. 72), and African Americans and Hispanics

(Tourangeau et al., 2013, p. 153). This can be remedied by using an online probability-based survey research panel like GfK's KnowledgePanel, however accessing such a panel comes with higher costs.

There is also concern about the accessibility of web surveys for differently abled individuals (Gottliebson, Layton, & Wilson, 2010, p. 401) and for those with low literacy levels (Tourangeau et al., 2013, p. 146). For people without literacy issues, web surveys have been found to reduce cognitive burden in comparison to interviewer-administered surveys because respondents can work through the questions at their own pace and reread if needed, which research shows they often do (Tourangeau et al., 2013, p. 146).

Another disadvantage of online surveys is that their appearance can vary based on the respondents' hardware and software (Christian, Parsons, & Dillman, 2009, p. 394; Tourangeau et al., 2013, pp. 131–132). Mobile devices are becoming an increasingly popular tool, which have their own host of concerns for online surveys (Tourangeau et al., 2013, p. 60). Some researchers recommend that the design of an instrument be treated as being equally important as its content (Puleston, 2011, pp. 557–558; Tourangeau et al., 2013, pp. 63–65, 67, 76, 98). Best practices from the current literature on Internet-based surveys (addressed throughout this chapter) were used when designing this research to limit known issues associated with web surveys as well as to capitalize on its advantages over other mediums.

3.4 Sample Size

Prior to beginning the data analysis, several projections were made to help determine what sized sample was necessary for this research. This was determined by taking three

factors into account: 1) cost; 2) results from a power analysis; and 3) the margin of error (MOE). For cost, it was not possible to exceed the USD\$12,000 secured to fund the data collection, which meant that the total number of individuals in each of the groups would be limited by this upper bound.

A power analysis is useful because it determines whether the sample is large enough to detect a statistically significant effect if one exists. If a sample is too small (i.e., the study is under-powered) it may appear as though there is not a statistically significant difference even if the effect is real because the sample is too small to detect it (Field, 2009, p. 58). To avoid this scenario, a power analysis was conducted prior to finalizing sample size requirements using G*Power (University of Dusseldorf, n.d.).

Because the study was not primarily an experimental design (and thus had no obvious outcome measure), the power analysis was conducted for the behavioural intentions question, which was thought to reflect an important aspect of the survey and had some basis in the literature that could inform the calculation. There is no literature on willingness to adopt a chicken-free diet, however a study by Faunalytics (2007) had comparable information for both a vegetarian and a reduced-meat diet. While the questions in that study were not perfectly analogous with those in this research, the means and standard deviations were thought to be a useful approximation. An a priori power analysis was used to calculate the required sample size assuming power of 0.80 (Greenland et al., 2016, p. 345) and an alpha of 0.05. The calculation involved an independent samples two-tailed *t*-test (as outlined in the pre-analysis plan), however, as discussed elsewhere, *t*-tests were later abandoned in favour of post-hoc tests.

The results for this narrow exploration showed that there was more than enough sample to observe an effect. This was a result of the fact that a USD\$12,000 budget

would be sufficient to secure 320 completes from vegetarians given early data collection cost projections and prevalence rate estimates for what was anticipated to be the smallest group in the study at the time. Powering at 0.80 and using $p < 0.05$, the analysis showed that each group should have at minimum 36 respondents.

The MOE was calculated for what was expected at the time to be the full sample (18,634), which resulted in a MOE of $\pm 0.7\%$, i.e., $(0.95 / \sqrt{n \times 100})$. A MOE was also calculated for the expected size of each of the six sub-samples (320), which was $\pm 5.3\%$.

3.5 Participants and Procedure

Participants were sourced from Nielsen, a sample provider who offered access to a census-balanced sample of U.S. residents 18+ years of age. Nielsen was selected as the sample provider after securing quotes from several other companies including AmeriSpeak (through NORC at the University of Chicago), AMR (Advanced Market Research), GfK KnowledgePanel, Ipsos, Qualtrics, Toluna, and YouGov. When possible, quotes for sample only (as opposed to full service) were secured. Companies that the principal investigator (PI) had an existing relationship with were selected to provide quotes and the remainder were found using the European Society for Opinion and Marketing Research (ESOMAR)'s Directory of Research, which lists 1,600 major research organizations worldwide (ESOMAR, n.d.).

Companies with cost competitive quotes were compared based on their answers to ESOMAR's "28 Questions to Help Buyers of Online Samples" (ESOMAR, 2012). These guidelines take in topics such as sample source, sampling procedures, the number of panelists, router allocation, profiling, invitation protocols and frequency, incentives,

data quality, identity authentication, opt-in procedures, etc. Google Consumer Surveys was ruled out because it cannot accommodate more than 10 survey questions. Amazon Mechanical Turk was also removed from consideration because they are a self-service platform without a project management team to ensure census-balancing, etc. In the end, Nielsen was chosen because of their good balance between cost competitiveness and data and service quality, as well as because the PI had worked with them previously.

Nielsen invited panelists from their sample as well as vetted partner samples (given the large sample size) to participate by providing a link to the online Qualtrics survey. The sample was selected by Nielsen based on the demographic characteristics of potential invitees to ensure the sample was as close to census-balanced as possible. The census-balancing was based on non-interlocking quotas²⁶ for age by sex, region, race/ethnicity, education, and household income.

The size of the sample was dictated by the minimum desirable size for the smallest of the four groups to be surveyed, based on how they fall out naturally in the U.S. population. Before data collection, the smallest segment was presumed to be vegetarians, estimated to be 1.9% of the U.S. population 17+ years when including vegans (Asher et al., 2014b, p. 4). The chicken avoiders group was thought to be the next smallest at 5% of the population (Asher et al., 2014b, p. 8).

Given the costs of such a large survey, a two-tiered process was used in real time to reduce the number of completed responses needed, which helped ensure a roughly

²⁶ Non-interlocking quotas set targets for separate variables (e.g., one quota for education and another for region), while interlocking quotas consider multiple variables at once (e.g., a quota for high school-educated individuals from the Northeast).

equally-sized sample from each of the six survey paths: 1) vegetarians; 2) meat reducers; 3) chicken avoiders; 4) non-reducing omnivores asked about a vegetarian diet; 5) non-reducing omnivores asked about a reduced-meat diet; and 6) non-reducing omnivores asked about a chicken-free diet.

More than 30,000 respondents were screened. All vegetarians and chicken avoiders proceeded to the full survey. To avoid oversampling the other four groups and thus drastically increasing costs, only a proportion of each were randomly assigned to continue. Nielsen does not charge for any respondents who do not complete the full survey. As such, fielding continued until the desired number of completes were secured for each group, which meant that attrition did not need to be taken into consideration. It was, however, necessary to consider the possibility of losing participants during post-collection data cleaning.

3.6 Experimental Element

Although the study design was cross-sectional, it did include an experimental element: the random manipulation of which diet path non-reducing omnivores were assigned. There was one treatment arm for each of the three diets under study, which allowed for an assessment of how certain variables differed based on which diet was presented. This design also helped mitigate spillover effects, so the same individual was not asked about all three diets. Additionally, because assignment was random to each of the non-reducing omnivore groups, it was possible to generalize the findings for each diet to the entire U.S. adult non-reducing omnivore population.

3.7 Programming

The survey was programmed and hosted on Qualtrics' online survey platform using UNB's license.

3.7.1 Randomization

The randomizations and terminations had to be completed in real time given that the screener could not be split from the full survey as a longitudinal design would have significantly increased costs and introduced concerns about attrition. It was also not desirable to let the randomization fall out naturally because the quotas for meat reducers and non-reducing omnivores would have been filled quickly, which could have led to bias with early responders differing notably from later responders. Additionally, not allowing each respondent an equal chance of proceeding to the full survey would have limited the ability to describe the assignment as truly random.

To work around these concerns, the screener first classified respondents as belonging to one of four groups: vegetarians, meat reducers, chicken avoiders, and non-reducing omnivores. Qualtrics' randomizer was used to randomly assign a portion of meat reducers and non-reducing omnivores to proceed or to be terminated. Because the vegetarian and chicken avoider groups were very low incidence, there was no need for a randomization scheme to randomly assign a selection of participants to proceed to the main survey. Instead, all those who fit the classification were permitted to advance in the survey.

3.7.2 Survey Look and Feel

Many best practices were used to ensure the survey's visual appearance helped rather than hindered respondents' progress and their ability to provide accurate responses. The pre-established UNB theme for Qualtrics was used, which set the look and feel of the entire survey with the university's name and colours. A progress bar (without text) was used to communicate to respondents how much of the survey remained. This was thought to be a respondent-friendly choice, although some survey methodologists advise against using a graphical progress indicator (Dillman, Smyth, & Christian, 2014, p. 326). A back button allowed respondents to reverse in the survey if needed, except when this was incompatible with randomization schemes, display logic, etc. While a back button is rarely used, the absence of one can notably increase the extent of break-offs (Dillman et al., 2014, p. 321).

Page breaks ensured that the survey was presented in manageable pieces with only one question per page in all but a few instances. This also had the advantage of saving the data for each question as it was submitted so that data from participants who broke-off was not lost. A single question per page format is the most common approach for online surveys, partly because interactive features and skip patterns can be incorporated with this design and it is also mobile friendly (Dillman et al., 2014, p. 315). More than one question was displayed at a time for the less essential questions near the end of the survey and also in one instance where it was thought to help respondents process the meaning of the questions (Dillman et al., 2014, p. 315).

Instructions with additional information were included directly in the questions themselves as per the advice of Dillman, Smyth, and Christian (2014, p. 187). Shading was used for every second row in a grid to help limit "straightlining," i.e., instances

where participants provide the same response for each question when this does not reflect their true attitudes or behaviours. Likert scales were presented equally spaced in one continuous horizontal row or vertical column so the scale's order was reinforced by the visual layout to help respondents better process the categories (Dillman et al., 2014, p. 199).

Underlining was used to draw participants' attention to critical aspects of the question wording. This is a common practice, though there are concerns in web surveys given that underlined words may be confused with clickable links (Dillman et al., 2014, p. 185). Underlining was used because the question wording was by default bolded and because italics was not thought to add sufficient emphasis. Qualtrics confirmed that the survey would function on different web browsers, and steps were taken to ensure the survey was mobile friendly, particularly for matrix tables. Mobile compatibility was important as many of Nielsen's young respondents come in via mobile. The survey also frequently made use of horizontal radio buttons to help prevent order effects.

3.7.3 Features

Several programming features were used to improve the quality of the dataset, including a speed warning and a speed termination point administered in real time for the screener to help bolster respondent quality. The speed warning was issued just before the FFQ was displayed, given that it was the most crucial question in the screener. The warning was triggered if a respondent's time on the survey up to that point was less than 30 seconds. Speeders were terminated if they completed the screener in less than 50 seconds, which amounted to only nine individuals out of 30,689 in the uncleaned, unweighted dataset.

Prior to administration, quotas were set in Qualtrics for the demographics used for census-balancing and the six respondent groups to ensure none were over-recruited. Because the prevalence rates and census-balancing did not fall out as planned, these quotas were abandoned during collection. Display logic was used in several places in the survey for questions on race/ethnicity, diet classifications, and for the instructional manipulation check (IMC).

Participants were not permitted to save their survey to continue it later. If respondents left their browser open for an extended period, their partial responses were closed after four hours (the smallest window available on Qualtrics). This was done because of concerns that participants would forget instructions presented earlier in the survey. This was especially critical for non-reducing omnivores given that they were given instructions for a unique diet path, which may have been a novel concept at the time.

Redirect links from Nielsen were added into the survey to ensure they could track respondents' status (to assign inducements for example) in four ways: completes, over quota, terminates (i.e., did not qualify), or quality terminates. Steps to confirm panel company integration were also taken to ensure that participants' Respondent ID (RID) through Nielsen was captured in the Qualtrics dataset to help authenticate respondents as well as to identify duplicates cases.

To protect participants' privacy, responses were anonymized in Qualtrics to ensure no personal information was recorded (e.g., IP address). All questions were force response—meaning that participants had to provide an answer prior to proceeding—except for one instance where the question type did not permit that functionality. Force response was used to limit missing data and was thought to be an appropriate choice for

the sample given panelists' familiarity answering survey questions in exchange for an incentive. Efforts were made during piloting to detect instances where a respondent was forced to provide an answer when none of the given options applied. It should be noted, however, that survey methodologists have identified shortcomings that result from making survey questions mandatory (Manfreda & Vehovar, 2008, p. 278).

3.7.4 Testing

Given the complexity of the survey, a variety of steps were used to extensively test it prior to launch. The PI self-administered the survey multiple times assuming the role of different respondents to check end of survey points, the speed warning, display logic, question order, and that the appropriate terminology was used for the different survey paths. The survey programming was also carefully reviewed in the back-end of the Qualtrics platform as a double check for quotas, termination points, speeding, completes, end of survey points, embedded data, etc.

The data dictionary was closely examined prior to fielding to ensure the variable names and labels as well as the embedded data were displaying as planned. As a final precaution, an individual with experience in animal advocacy research and Qualtrics was recruited through the EAA Facebook group ("Effective Animal Advocacy – Discussion Facebook Group," n.d.) to review the survey programming on the Qualtrics platform. In exchange, a USD\$50 donation was made to a charity of their choice. Nielsen also tested the survey before launch to ensure respondents could access the survey and return to their website with the appropriate status. As per their policy, they did not specifically test to ensure logic or survey programming was working.

3.8 Materials

3.8.1 Survey Instrument

For the complete survey instrument and further details about the Qualtrics programming see APPENDIX F – Survey Instrument. For an overview of the survey flow for the different respondent paths see APPENDIX B – Survey Flow.

The median completion time was 12 minutes and 14 seconds and the mean was 16 minutes and 51 seconds. The latter is considered a less accurate estimate of the length of interview (LOI) in this case given that there were respondents with unusually long completion times who may have kept their browser open to return to the survey before it timed out, which would have distorted the average. The median completion time varied based on which of the six survey paths was followed. The completion times by path were: vegetarians (9 minutes 18 seconds), meat reducers (12 minutes 5 seconds), chicken avoiders (12 minutes 10 seconds), omnivores in the vegetarian diet path (13 minutes 10 seconds), omnivores in the reduced-meat diet path (13 minutes 46 seconds), and omnivores in the chicken-free diet path (12 minutes 34 seconds).

3.8.2 Question Wording

As per Dillman et al.'s (2014, p. 135) advice, for questions with an either/or format, both the positive and negative aspects of the question were highlighted. For example, “indicate your agreement” was instead worded as “indicate your level of agreement or disagreement.” Path-specific wording was also used throughout the survey. Best practices were used to set answer options for Likert scales, including ensuring the

endpoints were maximally differentiated, that all response options were mutually exclusive, that each point on the scale was labelled to reduce statistical noise, that the scale was balanced, that there was consistency in language, and that the scale points corresponded directly with the topic of the question (Vannette, 2016a). Following the advice of Dillman et al., (2014, pp. 134–135) the wording “if at all” was added to the question text for bipolar scales and “if any” for unipolar scales to signal that a neutral or “not at all” answer option was acceptable.

3.8.3 *Multi-item Measures*

For multi-item measures, the score was calculated using the mean score of all the items. A reliability analysis was run when multiple items were used to measure one construct. All reverse-phrased items were reverse scored prior to analysis. For a measure to be considered reliable, it should “consistently reflect the construct that it is measuring” (Field, 2009, p. 673). From a statistical standpoint, reliability means that “individual items (or sets of items) should produce results consistent with the overall questionnaire” or construct (Field, 2009, p. 674).

The most commonly used measure of a multi-item scale’s reliability is Cronbach’s alpha (α) (Field, 2009, p. 674; Warner, 2013, p. 931). It is generally accepted that an alpha at or above 0.7 or 0.8 indicates a reliable scale, though there are disagreements on this threshold (Field, 2009, pp. 675 & 679). It is common practice to delete a scale item if it will dramatically increase the reliability of a scale (Field, 2009, p. 677; Warner, 2013, p. 936). However, for these purposes, if the scale originated from the existing literature, no items were deleted to preserve the scale in its original form, which may present limitations.

3.8.4 IMC

Attention checks or IMCs can be used to identify inattentive respondents on self-administered surveys to address quality issues (Berinsky, Margolis, & Sances, 2014, p. 739). One such question was used as the last question of the screener, with wording loosely based on the work of Belinsky, Margolis, & Sances (2014). Those who failed this IMC as well as an additional check (a double fail) were not permitted to proceed given that respondent quality can be an issue with online panel respondents. From the uncleaned, unweighted dataset, 1,954 individuals out of 30,689 were terminated for failing both questions.

There are concerns about removing respondents who fail a single screener. This may create a sample with skewed demographics given that failing a screener can correlate with certain characteristics, e.g., age, education, and race (Berinsky et al., 2014, p. 751). However, in this case, individuals were removed before entry into the official survey and Nielsen continued to recruit a census-balanced sample, which limited concerns in this regard. More than one attention check question was also used. Per Rouse's (2015) findings, respondents were asked whether they were paying attention and their data should be kept. Rouse's (2015, p. 306) research found:

“a notable improvement in reliability occurred when respondents were simply asked whether or not they were attentive and given the option to have their data retained or deleted. Interestingly, this improvement in reliability was not attained through the elimination of the 2% of respondents who acknowledged that they were inattentive; rather, the reliability of the scores obtained from those who affirmed their attentiveness was higher than that seen for comparable samples who were not asked to give an affirmation.”

Some of the respondents who failed the IMC seemed to take this personally, indicated by comments such as: “when it asked me what meats i was familiar with, i didnt [sic] want to click any because i dont [sic] eat meat. but when i had to click one, the survey accused me of no [sic] being consistant [sic] with my data;” “It was VERY INSULTING to be told that I had contradicted my preference for a Vegetarian diet after I responded to your question about whether I was familiar with certain kinds of lunch meats. YES, I know of many and ate many when I was younger, but that hould [sic] NOT indicate to YOU that I was not telling the truth. Instead, it shows a problem with how your survey is set up;” and “very good topic but at 1 point you said i [sic] was not paying attention on 1 question i [sic] can without a doubt tell you all my answers were the truth if you do not want what i [sic] think or in some cases the truth you best not ask me thank you.” This raises concerns about these types of questions. The benefit is that they can help identify inattentive respondents, which is especially important in an online panel, however, there is also the possibility that those who proceed in frustration could deliberately provide poor quality responses.

3.8.5 Respondent Appreciation

Given the length of the survey, a screen mid-survey displayed a brief thank you to participants for their responses up to that point as per Qualtrics’ recommendation (Vannette, 2016b). As is discussed later, Nielsen also gave participants an inducement to honour their time commitment.

3.9 Measures

The measures used in this study are presented below. It is worth noting that these measures and the resulting findings are not meant to imply a causal order. When a research question asks, for example, which of the three diets has the best outcome on a specific variable, this is not intended to suggest that the variable in question predicts diet choice or vice versa. Specifically, the term “outcome” should not be taken as implying a causal order such that the diets are the independent variable and the outcomes the dependent variable. Rather, these research questions were meant to look only at which of the three diets *performed* the best on a given indicator (i.e., had the best rating), which allowed the topic of performance, rather than prediction, to inform the main EAA research problem.

3.9.1 Dietary Assessment

There are many ways an individual’s diet can be assessed, most notably by using FFQs, 24-hour recalls, or other dietary records (Falomir et al., 2012, p. 965; NutritionQuest, n.d.-b). Outside of self-reported instruments, there is the potential to track diet using nutritional biological markers, however this is impractical for most endeavours (Apovian et al., 2010, p. 620).

Recalls and FFQs are the most common dietary assessment tools in epidemiology (Falomir et al., 2012, p. 965). Recalls require participants to make note of all food and beverages consumed in a 24-hour period. They are useful to measure recent, as opposed to usual, intake and provide greater specificity (McNutt, Zimmerman, & Hull, 2008, p. S20; Thomson et al., 2003, pp. 754–755) and decrease measurement error (McNutt et al., 2008, p. S20). Recalls were not a fitting measurement tool for this

research given that an individual's diet can fluctuate substantially from day to day and a single 24-hour recall does not provide a reliable estimate of an individual's habitual intake (NutritionQuest, n.d.-b). While its strength is in its ability to describe a *group's* average intake (NutritionQuest, n.d.-b), a further requirement of this research is to describe individual diet. Multiple 24-hour recalls do offer a closer representation of an individual's typical diet (NutritionQuest, n.d.-b), though it is onerous for respondents and costly for researchers (NutritionQuest, n.d.-b; Thomson et al., 2003, pp. 754–755).

3.9.1.1 FFQs

In use in some form for half a century, FFQs assess an individual's usual diet over a set period (Brown, 2006, pp. 1541–1542; Falomir et al., 2012, p. 965). This is done by asking respondents to indicate the frequency with which they consume a list of foods, such as times per day, week, month, etc., (McNutt et al., 2008, p. S20). FFQs can assess an individual's usual intake at a relatively low cost (McNutt et al., 2008, p. S20; Molag et al., 2007, p. 1468; NutritionQuest, n.d.-b; Salvini et al., 1989, p. 859) and with limited time investment (McNutt et al., 2008, p. S20). They are also not overly complicated for participants to navigate (McNutt et al., 2008, p. S20; NutritionQuest, n.d.-b). All of this made an FFQ a useful instrument for this research.

Assessing usual dietary intake is cognitively complex (Brown, 2006, pp. 1541–1542) and it is made even more so when an FFQ has a long assessment period that requires that participants “invoke habitual memory of dietary intake over the relevant period and do the arithmetic necessary to estimate average exposure over well-defined periods” (Hebert et al., 1997, p. 1051). Generic memories of dietary intake are thought to supersede more specific ones for assessment periods that take in more than two weeks

(Hebert et al., 1997, p. 1051). While specific memory is most evident in a 24-hour recall, generic memory (which makes use of general impressions of habitual diet) comes into play in FFQs and is thought to be more prone to social approval bias (Miller, Abdel-Maksoud, Crane, Marcus, & Byers, 2008, p. 2).

There are thus concerns with the accuracy of self-reported recall dietary data, which marks a notable limitation of this research project. Although FFQs are often the method of choice for large government and academic studies—particularly those connected to epidemiology and to producing dietary guidelines—they have come under fire most recently by Archer et al., (2015). The researchers call into question the use of “memory-based dietary assessment methods” which they say are “fundamentally and fatally flawed” (Archer et al., 2015, p. 911). There have, however, been responses to this critique, most notably by Subar et al., (2015, p. 1) who put forth a strong recommendation for the continued collection of self-reported dietary intake data because such data “contain valuable, rich, and critical information.”

Although the term FFQ is used throughout this dissertation, the FFQ used in this study may be more appropriately thought of as a screener (a type of short dietary assessment instrument) given that it queries about a limited number of foods that are restricted to one food group, i.e., meat (National Cancer Institute, n.d.). The frequency scale for the FFQ was based loosely on the Block Meat FFQ for Adults (NutritionQuest, n.d.-a). It was optimized for the individual types of meats in the food list, rather than the catchall category for all meats, which would have necessitated higher ranges on the far end of the scale. This is of note because the type of scale used impacts the nature of the responses, often referred to as response scale effects or scale range effects (Dillman et

al., 2014, pp. 161–163; Groves et al., 2009, p. 236; Smyth, Dillman, & Christian, 2009, pp. 427–443; Toepoel, Vis, Das, & van Soest, 2009, pp. 371–392).

Several examples for each category in the food list were offered as memory cues. Instructions were used to help prompt accurate recall and to encourage respondents to take their time and carefully consider their response given that the question was thought to be prone to problems, especially memory problems (Groves et al., 2009, p. 229). Groves et al. (2009, p. 230) note that the “best antidote to retrieval failure in surveys seem to be providing more retrieval cues and getting respondents to spend more time trying to remember” and that “questions that work best have rich, relevant cues and give the respondent time and encouragement to think carefully.” This particular type of FFQ offers a rate-based estimation, where respondents “recall the rate at which incidents typically occur and extrapolate over the reference period,” which can be prone to over-reporting of behavioural frequencies (Groves et al., 2009, p. 235).

The items in the food list were not randomized given that it is good practice to place items of greater importance (e.g., chicken) closer to the beginning as opposed to the end when measurement error is more likely to occur. Importantly, these items should not be placed at the very beginning either given that errors are more typical while respondents are acclimatizing to an instrument (Cade, Thompson, Burley, & Warm, 2002, p. 570). The reference period for this FFQ was “current diet”—a period that will differ by person as opposed to being a fixed timeframe such as the past week, month, year, etc. Unlike other studies (Asher et al., 2014a; Macdonald, Caldwell, & Boese, 2016), plant-based “distractor” foods were not used in the food list to mask the purpose of the question given that research increasingly suggests this is not necessary (Asher, 2016b; Hurford & Anthis, n.d.).

3.9.1.2 *Meatless Meals*

Participants were asked how many meals they ate in total as well as how many they ate containing meat over a seven-day period separated out by breakfasts (or the first meal of their day), lunches (or second meal of their day), and dinners (or third meal of their day). The wording was based loosely on Fehrenbach (2015, p. 89) and Schnabelrauch Arndt (2016, p. 247). Before the question was segmented by meal type, cognitive interviewing participants answered the question aloud by thinking about breakfasts, lunches, and dinners, which signaled it was best to ensure this distinction in the final iteration of the question.

The question employs a “recall-and-count” strategy where respondents recall specific events and add them up (Groves et al., 2009, p. 235). This was used as opposed to a FFQ rate-based estimation approach with ranges for meal consumption because, as Groves et al., (2009, p. 235) note, the recall-and-count strategy is particularly suited to when the number of instances does not exceed seven. Following best practices, the reference period covered by the question was specified (Groves et al., 2009, p. 244).

There are disadvantages to asking about diet in this format, including it being “prone both to omissions due to forgetting and false reports due to telescoping” (Groves et al., 2009, p. 235). Respondents may also face computation and recall challenges (Gordon B. Willis & Lessler, 1999, p. 11). There is also the risk of under-reporting, as Ball (2015b, p. 4) notes:

“People don’t necessarily note when they have meat-free meals. One of the team members was interviewing another team member’s roommate, and asked the roommate when the last time the roommate had had a meatless meal was. ‘Oh, I can’t remember. Has been ages.’ But they had just had vegetarian Pad Thai the night before.”

Since the data for meals and meat-based meals was entered manually by participants, it was trimmed by removing outliers from the analysis using the outlier identification feature in SPSS, which looks for outliers (denoted with a circle in a boxplot) that are between one and a half and three times the interquartile range (IQR), as well as extreme outliers (denoted with an asterisk) which are more than three times the IQR. There is debate about whether removing outliers using the one and a half multiplier is too liberal an approach (Hoaglin & Iglewicz, 1987). As such, only extreme outliers were marked as missing in the analysis. A further precaution was taken to avoid over-cleaning the data such that extreme outliers were only removed when visual inspection confirmed this was the best approach (i.e., when an outlier could be clearly identified on a histogram) so as not to be overly wed to the SPSS outlier feature at the expense of a personal review of the data.²⁷

A variable was created for meatless meals (MEALS - MEATMEALS), which poses limitations in terms of out of range values. In retrospect, it may have been more appropriate to ask respondents to estimate their proportion of meatless meals, rather than having to calculate this number from the two estimates. This was avoided during the design phase due a suspicion that respondents may be better able to recall their meat-based meals than their meat-free ones. Data cleaning was *not* undertaken to ensure that the number of meat-based meals did not exceed the number of meals separately for breakfasts, lunches, and dinners. However, if the combined score was negative it was marked as missing for analysis purposes.

²⁷ Note that the visual outputs (boxplots and histograms) are not shown herein.

The proportion of meals that were meat-based and the proportion that were meatless were calculated. If the proportion was higher than 100 it was marked as a missing value. There were instances of respondents who eat meat indicating that 100% of their meals were meat-based. These values were not corrected as this is theoretically possible. No effort was made to determine if there were any instances where respondents indicated that they ate no meals or where non-vegetarians indicated that they eat no meat-based meals because it is theoretically possible that individuals do not see themselves as eating “proper” meals but rather having snacks, grabbing food on the go, etc., which may have influenced how they interpreted the question. Because of the quality issues with this measure, the results should be interpreted with caution.

3.9.2 SWFL

Participants indicated their satisfaction with their food-related life using five items on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale related to: finding food and meals to be negative elements in one’s life; being generally displeased with food; getting satisfaction from food and meals in daily life; life in relation to food and meals being close to one’s ideal; and conditions of one’s life being excellent with regard to food. All participants provided answers for their current diet and non-reducing omnivores also gave responses imagining that they ate one of these diets.²⁸

²⁸ A second measure of food satisfaction was included in the survey. However, it was removed during analysis given that its topic overlapped too much with the SWFL scale. The scale was prioritized over this other food satisfaction measure given potential weaknesses with single indicator measures (Bryman, 2002, p. 166).

This item is based on the SWFL scale from Grunert et al., (2007), where they tested seven items on a sample of European seniors, which later resulted in a five-item scale (Grunert et al., 2007, pp. 488 & 490). The possibility exists that this scale was not as relevant to individuals in this study, especially younger people who may not engage in things such as meal planning, meal preparation, shopping, etc. However, the scale has been administered to other demographic segments, including a university sample (Schnettler et al., 2014, 2015). Some adjustments were made, including adding reverse wording to two of the items and using a 5-point Likert scale instead of a 7-point one to be consistent with other scales in the survey.

For non-reducing omnivores (external perceptions), a reliability analysis with the five items from the SWFL scale was run giving a Cronbach's $\alpha = 0.83$, which indicates good reliability. There were no items that if deleted would have increased the scale's reliability. For current meat restrictors (internal experiences), a reliability analysis with the five items from the SWFL scale was also run giving a Cronbach's $\alpha = 0.72$, which also indicates good reliability. There were no items here either that if deleted would have increased the scale's reliability.

3.9.3 Previous Diet

Respondents were asked if they previously ate any of the diets under study. They were not asked whether the previous diet immediately preceded their current diet as all transitions, even those that were indirect, were of interest. A two-step verification process—the use of a food list after identification with the label—was not used to confirm the answers as it was not a central question of the research and so would have unnecessarily added to respondent burden. Consequently, the lapsing rates presented in

this study could be, and most likely are, an over-representation. For example, Asher et al. (2014a, p. 2) found that half of respondents who indicated they previously consumed a vegetarian or vegan diet failed the food list verification. This aligns with literature on the over-reporting of current vegetarianism (Juan et al., 2015, p. 86; Lea & Worsley, 2001, pp. 127–128; Ruby, 2012, p. 148). Whether the extent of over-representation is of the same degree for each of the three diets is uncertain.

3.9.4 *Familiarity*

Non-reducing omnivores indicated their level of familiarity with one of the three diets on a 1 (*not at all familiar*) to 5 (*extremely familiar*) scale. This measure gives a baseline sense of the extent of awareness among the public about these diets. It speaks to where the population is in terms of knowledge about different types of meat-restricted diets and relates to food norms. The topic of familiarity with vegetarians has been addressed elsewhere, including by MacInnis and Hodson (2015, p. 6) who inquired about whether respondents had previously heard of these individuals and if they knew what it meant to be a vegetarian or vegan.

3.9.5 *Perception of Prevalence Rate*

Respondents indicated what percentage of the U.S. adult population they believe eats one of the three diets using a 0–100 slider. This question was used to speak to food norms. It assessed perceptions versus reality to determine whether respondents under- or over-estimate the proportion of the three diets. This in turn indicates whether they believe it is more or less “normal” to eat the diets than it is. The question wording was

based loosely on research on the proportion of immigrants among the population by Ipsos MORI (2014).

3.9.6 *Social Ties*

Participants indicated to what extent they have strong and extensive ties to people who eat one of the diets on a 1 (*not at all*) to 5 (*very great extent*) scale. This measure was used to assess food norms and levels of social support. The subject of social ties among vegetarians has been addressed by MacInnis and Hodson (2015, p. 6) who inquired about how many vegetarians or vegans participants knew personally. It has also been studied by Asher et al. (2014a), who explored whether participants had sufficient interaction with other vegetarians, whether they were actively involved in a vegetarian group or organization, if they regularly shared meat-free meals with those they live with, and the role played by significant others.

3.9.7 *Thermometer*

Non-reducing omnivores indicated their feelings towards people who eat one of the three diets using an attitude thermometer represented as a 0–100 slider. This measure speaks to stigma. Others have used attitude thermometers to measure feelings towards vegetarians or other frequently marginalized groups (MacInnis & Hodson, 2012, p. 730, 2015, p. 6; Pew Research Centre, 2014). The question wording was based on this work. While little has been known until now about attitudes towards meat reducers and chicken avoiders, there is a fair amount of literature on attitudes towards vegetarians. This includes the Attitudes Toward Vegetarians scale (Chin et al., 2002), avoidance of vegetarians and vegans and stereotyping to do with competence and warmth (MacInnis

& Hodson, 2015, pp. 6 & 12), conceptualizations of vegan “killjoys” (Twine, 2014), views of vegans as “angry, fanatical, judgmental” (Ball, 2015b, p. 3), and the existence of vegaphobia (Cole & Morgan, 2011).

3.9.8 TTM SOC

Non-reducing omnivores were asked to place themselves on the TTM SOC using a 1 (*I am not thinking about adopting*) to 3 (*I have decided to but have not yet adopted*) scale. Non-reducing omnivores were assessed in terms of their cognitive change (precontemplation, contemplation, preparation) as opposed to behaviour change (action and maintenance). The TTM SOC was originally developed for use in clinical settings for behaviour change around addiction (DiClemente & Prochaska, 1982). This measure was used to speak to readiness to change one’s diet. The TTM SOC has been previously used to assess individuals in terms of their readiness to reduce their meat consumption (Tobler et al., 2011) and to eat a plant-based diet (Lea et al., 2006).

3.9.9 TPB

The TPB is considered valuable in forecasting intentions and behaviours in a variety of contexts, including diet (Yadav & Pathak, 2016, p. 123). The theory holds that “an individual’s decision to choose one behaviour over another where the behaviour is volitional (i.e. under the individual’s complete control) will predict whether or not he or she will carry out that behaviour” (Povey et al., 2001, p. 16). The theory is divided into two parts: an individual’s intentions to perform the behaviour and their confidence in their ability to perform the behaviour (Povey et al., 2001, p. 17). These are tested using four determinants: behavioural intentions, attitudes, perceived behavioural control, and

subjective norms. It is important to note that while the TPB is considered an important predictor of intentions and behaviour, such projections are not always accurate given the complexity of human behaviour change including for dietary modification.

3.9.9.1 Behavioural Intentions

Current meat restrictors indicated whether they intend to continue eating their diet in the future on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. Non-reducing omnivores indicated how willing they would be to adopt one of the diets in the future on a 1 (*not willing*) to 5 (*willing*) scale. The term “adopt” was used rather than “try” to mirror advocacy language, which inclines more toward calls to action to “go veg” than to “try veg,” although there are initiatives such as 30-day veg challenges where the “try” is implied. Non-reducing omnivores were not asked to indicate which diet they would be *most* willing to adopt given that the interest was in capturing *any* interest, which allows the information on willingness to speak to the degree of impact if the full potential for each diet was explored, knowing that there is likely to be overlap between segments.

Other scholars have used the TPB to assess behavioural intentions towards eating a vegetarian diet (Povey et al., 2001), reducing meat consumption (Truelove & Parks, 2012), and changing meat consumption (Berndsen & van der Pligt, 2004). This behavioural intentions question is different from the TTM SOC in that the latter speaks more to intentions and decisions than to willingness. It is likely that the intenders and deciders are a subset of those who are willing and so the purpose here is to capture the larger potential that these diets hold.

3.9.9.2 Attitudes

Participants rated their overall feelings towards one of the diets on four scales: 1 (*bad*) to 5 (*good*); 1 (*harmful*) to 5 (*beneficial*); 1 (*unpleasant*) to 5 (*pleasant*); and 1 (*unenjoyable*) to 5 (*enjoyable*). The question wording was based on the work of Povey, Wellens, and Conner (2001, p. 19).

A reliability analysis with the four items for non-reducing omnivores (external perceptions) was run giving a Cronbach's $\alpha = 0.85$, which indicates good reliability. There were no items that if deleted would have increased the scale's reliability. For current meat restrictors (internal experiences), a reliability analysis with the attitude items gave a Cronbach's $\alpha = 0.88$, which also indicates good reliability and there were no items that if deleted would have increased the scale's reliability.

3.9.9.3 Perceived Behavioural Control

Participants indicated their degree of perceived behavioural control for following or continuing to follow one of the three diets for three items: the degree of personal control on a 1 (*no control*) to 5 (*complete control*) scale; extent of capability on a 1 (*not at all capable*) to 5 (*very capable*) scale; and level of ease or difficulty on a 1 (*very difficult*) to 5 (*very easy*) scale. The question wording was based on the work of Povey, Wellens, and Conner (2001, p. 19).

For non-reducing omnivores (external perceptions), a reliability analysis with the three items was run giving a Cronbach's $\alpha = 0.70$, which indicates good reliability. There was one item that if deleted would have increased the scale's reliability to 0.81. However, given that this is a common scale and the alpha is already within range this was not pursued. For current meat restrictors (internal experiences), a reliability analysis

gave a Cronbach's $\alpha = 0.87$, which also indicates good reliability and there were no items that if deleted would have increased the scale's reliability.

3.9.9.4 *Subjective Norms*

Participants indicated their degree of subject norms using the following items: the extent to which the important people in their life think they should eat the diet on a 1 (*not at all*) to 5 (*to a very great extent*) scale; and how much they want to eat what the important people in their life think they should on a 1 (*not at all*) to 5 (*very much*) scale. The question wording was based on the work of Povey, Wellens, and Conner (2001, p. 19).

Povey et al., (2001, p. 19) had separate items (for both subjective norm categories) for friends, family, partner, health experts, and colleagues. As such, adjustments were made to the number of items to decrease respondent burden. Given that subjective norms is only one among many topics explored in this survey, having ten items for this one topic seemed unwarranted. Wording updates to increase respondent understanding were also made in response to findings from the cognitive interviewing. As per Povey et al., (2001, p. 19), a subjective norm measure was devised by multiplying the two items together, which resulted in a variable with a range from 1 to 25 ($M = 3.4$, $SD = 3.6$).

3.9.10 Barriers

Participants indicated their level of agreement on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale with six²⁹ items connected to barriers: 1) It is inconvenient for me to eat a [diet type]/It would be inconvenient for me to eat a [diet type]; 2) My [diet type] creates issues in my social and personal life/A [diet type] would create issues in my social and personal life; 3) My [diet type] is good for my health/A [diet type] would be good for my health; 4) It costs too much to eat a [diet type]/It would cost too much to eat a [diet type]; 5) It is difficult for me to stay motivated enough to eat a [diet type]/It would be difficult for me to stay motivated enough to eat a [diet type]; and 6) I see a [diet type] as part of my identity/I would see a [diet type] as part of my identity.

Non-reducing omnivores answered imagining they ate the diet (for external perceptions), while current meat restrictors answered for their current diet (for internal experiences). The items were based on work by Asher et al. (2014a, 2015). Reverse-worded items were inverted prior to analysis to ensure each was a positive statement, with higher scores indicating: better convenience, fewer issues with social/personal life, better health, fewer cost concerns, fewer concerns about being able to stay motivated, and an increased sense of dietary identity.

3.9.11 Length of Adherence

Current meat restrictors (internal experiences) indicated their best approximation for how long they had been eating their diet without interruption. They were asked to

²⁹ As noted elsewhere, there was a seventh item to do with food satisfaction, however this was dropped during analysis because it was too similar to the SWFL question.

specify the number of years, months, and days when applicable, or whatever level of detail they could recall. Ranges for adherence were not used as has been done in other studies (Asher et al., 2014a; Haverstock & Forgays, 2012) because, for these purposes, the average length was of interest, which has been the case elsewhere as well (Animal Charity Evaluators, n.d.-b). This presents a limitation however because it is assumed that individuals can more accurately place themselves in a range than remember an exact length of observance.

Because respondents manually entered the number of years, months, and/or days they had adhered to their diet, there were some out of range values. Some respondents appeared to enter the year they adopted the diet (1971, 2000, 2015, etc.) rather than the number of years they had been eating that way. Likewise, some respondents entered a value greater than 11 for the number of months and greater than 31 for the number of days. In all these instances, the length of adherence data was excluded from analysis (marked as missing) to prevent taking too many liberties with imputation. These represent a very small proportion of cases. The average number of years was computed using the following formula: $\text{years} + (\text{months} / 12) + (\text{days} / 365)$.

3.9.12 Opinion Leaders

Participants indicated their level of agreement on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale for six items about being food opinion leaders: whether their opinion on food counts with other people; whether other people turn to them for advice when choosing what to eat (phrased two different ways); whether people they know pick what to eat based on what they have told them; whether they often persuade other people to buy foods they like; and whether they influence people's opinions about food. The

question wording is based on the work of Flynn, Goldsmith, and Eastman (1996), which has subsequently been used by others (Bertrandias & Goldsmith, 2006; Gnambs & Batinic, 2011; Goldsmith & Clark, 2008; Shoham & Ruvio, 2008) and builds on the influential work of Katz and Lazarsfeld (1955). Some adjustments to the items were made, including adding wording specific to food and using a 5-point instead of a 7-point Likert scale to be consistent with other scales in the survey.

Rogers and Cartano (1962, p. 439) have noted that this type of “self-designating technique” is contingent on participants being able to accurately report their “self-images on opinion leadership.” Though they explain that “one advantage of the self-designating technique is that it measures the individual’s perception of the opinion leadership situation, which is actually what affects [her or] his behavior” (Rogers & Cartano, 1962, p. 439). The proportion of opinion leaders is a useful metric as per Rogers’ (2003) work on the diffusion of innovations as well as effective altruism’s interest in the far future (Sentience Politics, n.d.). A reliability analysis with the six opinion leader items was run giving a Cronbach’s $\alpha = 0.81$, which indicates good reliability. There were no items that if deleted would have increased the scale’s reliability.

3.10 External Feedback

As is an increasingly desirable protocol for EAA research (Animal Charity Evaluators, n.d.-c; Smith, 2017), the study design was circulated on Google Drive for open external feedback beginning in late May 2016. The call for feedback included background information on the study as well as a copy of the research questions, survey instrument, and survey flow. A personal invitation to comment was sent to 24 individuals who

engage in animal advocacy research (both advocates and academics) or who have expertise in survey methodology. The call for feedback was also distributed on the public EAA Facebook group (“Effective Animal Advocacy – Discussion Facebook Group,” n.d.), which had 3,642 members on the day of the posting. A variety of comments were received and many updates were made to the research design in response.

The purpose of this approach was threefold: 1) to improve the caliber of the research; 2) to aid with research transparency; and 3) to bolster the practical relevance of this work through applied sociology. Seeking feedback from experts served to strengthen the research design by sourcing critiques ahead of time so constructive suggestions could be acted upon before the research scheme was finalized. By sharing an early draft of the research design with key stakeholders, the goals and methods of the project were communicated in a way that prevented the research agenda from being guarded as proprietary and opened the research itself up to outside accountability in some ways. Engaging a community of academics and advocates also helped honour the applied and real-world focus of this sociological research.

3.11 Pilot Testing

Prior to data collection, the survey instrument was piloted in two ways. The first was through in-person cognitive interviewing with a convenience sample. The second method was a field test that directly tested the online survey with a sample of the target population provided by Nielsen.

3.11.1 Cognitive Interviewing

The survey questions were piloted using cognitive interviewing to gain qualitative feedback about how the survey was answered and understood (Brancato et al., 2006, p. 127). Cognitive interviewing arose as survey methodologists became increasingly interested in how the tools used by cognitive psychologists could inform how individuals comprehend and respond to questions (Groves et al., 2009, p. 263). The cognitive interviewing technique is said to provide “valuable insight into the question-answering process to reduce measurement, specification and probably nonresponse error” (Brancato et al., 2006, p. 127). As Willis explains, cognitive interviewing is a method to pretest survey questions used to examine the “*comprehension, recall, decisions and judgment, and response processes*” of respondents as they answer questions (2005, p. 6) and to highlight any complications in this process (2005, p. 3).

Cognitive interviewing pinpoints both apparent and hidden issues in the answering process (Willis, 2005, p. 6). While the goal is to improve questions through inspection and problem-solving, cognitive interviewing does not validate questions in the traditional sense (Willis, 2005, p. 7) and as with any pretesting approach, cognitive interviewing is subject to limitations (Willis, 2005, pp. 228–229). As Groves et al., (2009, pp. 264–265) explain, “there is a critical need for empirical studies of the reliability of findings from cognitive interviews, their value in improving data quality, and the significance of the many variations in the way cognitive interviews are done.”

Cognitive interviewing often takes place in multiple rounds in order to incorporate and test modifications from a previous iteration (Willis, 2005, p. 7). Only one round of cognitive interviewing was used for this study because field testing of the online survey was also done with the target sample. Some cognitive interviews allow

respondents to complete a survey designed to be self-administered on their own before following up with probes (Willis, 2005, p. 205). This option was not pursued because mode-dependent issues were instead addressed during field testing. Although the PI read the questions aloud for respondents, they were also provided with a paper copy of the survey and asked to mark their answers and indicate any issues with the survey layout.

While there is no one best approach to cognitive interviewing (Groves et al., 2009, p. 264), there are two commonly accepted procedures: think-aloud and verbal probing, both of which come with their own advantages and disadvantages (Willis, 2005, p. 6). Some individuals respond better to one technique over another (Willis, 2005, p. 58), however the majority of cognitive interviews employ both approaches (Willis, 2005, p. 57), as was the case for this study.

Probes are used to pinpoint cognitive and other problems with survey questions relating to “comprehension, retrieval, decision, judgement, and response processes” (Willis, 2005, pp. 83–84). Probes can take many forms including comprehension/interpretation probes, paraphrasing, confidence judgements, recall probes, specific probes, and general probes (Willis, 2005, p. 48). Probing can be done during the question administration period (concurrent probing), which is a more typical approach, or afterward (retrospective proving) (Willis, 2005, pp. 51–52). For this research, probes were integrated into the question and answer period in a conversational manner to ensure that *how* participants had reached their answer could be easily examined.

A list of probes was constructed prior to the interviews. The PI omitted probes that did not apply in practice or were redundant based on what was covered during the thinking aloud process. The PI also had the flexibility to devise probes in real time

during the interview as topics presented themselves. The interview process allowed for both proactive and reactive probes (Willis, 2005, p. 88). Proactive probes are thought to detect instances of “silent misinterpretation,” while reactive ones allow for the discovery and examination of unanticipated problems (Willis, 2005, pp. 94 & 97). One disadvantage to using probes is that they run the risk of manufacturing problems where none exist (Willis, 2005, p. 115). Steps were taken to avoid over-probing as well as over-interpretation to be cognizant that not all results constitute a problem that warrants addressing (Willis, 2005, p. 126).

Individuals who have specific characteristics of interest for the target sample are typically chosen for cognitive interviews (Willis, 2005, p. 139). For these purposes, however, it was not feasible to have participants reflect the target sample as the cognitive interviewing was conducted with a convenience sample of individuals in the Fredericton, New Brunswick area. Individuals had to be 18 years of age to participate and were recruited through emails sent to undergraduates at UNB in the Faculties of Arts, Engineering, and Sciences, as well as students at UNB’s Renaissance College by way of their Facebook page. Prior to admittance, potential participants were asked about their diet to determine their eligibility to ensure there was not more than one individual interviewed for each of the six diet paths. A participant could not be found for the chicken-free diet path, which presents a limitation to this pilot testing.

Interviews with five individuals were conducted on July 5 and July 19, 2016 at UNB’s Harriet Irving Library. Three participants were female and two were male and they ranged in age from 20 to 26 years. Four participants were UNB students, while one was not affiliated with the university and found out about the opportunity through word of mouth. The sample size used reflects the best practice of interviewing between five

and 15 individuals in a single round (Willis, 2005, p. 7). The interviews ranged in length from 44 minutes to 1h and 6 minutes. To avoid overly burdening participants, not all questions were piloted such as the demographic characteristics.

An information letter was provided to participants at the beginning of the session to inform them of what their role entailed. The letter explained that the pilot involved testing a new survey and that they would be asked about their attitudes and behaviours regarding food. They were told that their involvement would be helpful in improving the survey questions before the official study was administered. The letter was presented along with an offer to read it aloud and to answer any questions participants had. To honour their time commitment, participants were provided with a \$15 cash honourarium at the beginning of the session.

Based on best practices (Utrecht Summer School, 2015; Willis, 2005, p. 91), the PI read out the question texts verbatim. If the respondent requested clarification, the PI avoided providing an interpretation and instead the participant was asked to consider how they would interpret the question if there were no one available to assist them. Probes were used as necessary and the PI took notes during the conversation on respondents' comments, questions, and nonverbal behaviour. The conversation was also audiotaped with participants' permission. For more on the cognitive interviewing methodology see APPENDIX C – Cognitive Interviewing Instructions and Probes.

Changes to the survey instrument were based on the notes taken during the interviews and each audiotape was also reviewed in full. The analysis of the interview data collected as well as the revisions to the survey followed an informal process rather than being guided by a formal coding scheme (Willis, 2005, p. 172).

3.11.2 Field Testing

Pretests, long a standard practice in survey research, are “small-scale rehearsals of the data collection conducted before the main survey” with the purpose to “evaluate the survey instrument as well as the data collection and respondent selection procedures” (Groves et al., 2009, p. 265). The survey and online platform were pre-tested in the field on September 29 and 30, 2016 with a sample of 203 individuals (including one duplicate entry) from Nielsen’s panel. This field test was used to identify technical issues and to further pinpoint problems with the survey questions with the target population.

There were 114 females, 88 males, and one individual who broke-off before providing their sex. The average age was 48 years, with participants ranging in age from 18 to 88 years (one individual abandoned the survey before providing their age). Several features of the survey were tested, with respondents classified as follows: 12 quality terminations; 15 break-offs during the screener before group assignment; one break-off after the screener/group assignment; 161 individuals randomized out after the screener; and 14 completes.

The field test was used to assess the LOI, the screener completion time, and the IR. The suitability of the threshold for the speed warning, the number of duplicates, and the proportion of respondents who failed the IMC and affirmation check were also examined. The answers to the open-ended questions was reviewed for red flags and questions that permitted free-form numeric responses were examined for out of range values.

Four additional questions were included in the field test, which asked: 1) Was there anything about your survey experience that was confusing or didn’t work well? If yes, please describe in detail; 2) Where you forced to answer a question, but none of the

answer options really made sense for you? If yes, please describe in detail; 3) Were there any questions that were unclear in a way that you had to guess at their meaning? If yes, please describe in detail; and 4) Was there anything about the formatting/layout of the survey that you found problematic? If yes, please describe in detail. Answers to these questions were reviewed and changes were made to the online survey before the official data collection began.

3.12 Ethical Protocols

The research was reviewed by the Research Ethics Board of UNB for its compliance with the *TCPS2 2014 Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada, 2014) and the *University Policy on Research Involving Humans* (University of New Brunswick, 2011). It is on file as REB #2016-080.

The research involved working exclusively with humans. No children were included as research subjects. The 52 participants who indicated they were under 18 years of age in the screener were not permitted to proceed with the study. The first screen of the online survey displayed an electronic letter of introduction (see APPENDIX F – Survey Instrument). Individuals were informed that participation was voluntary and that they may withdraw at any time. Though deception was not used, the letter only explained the study's purpose in general terms so as not to bias the results.

Nielsen sent invitations and arranged the inducements, so respondents were not required to provide their name, email address, phone number, or any other information thought to be personally identifying except their zip code (to allow for location-based

analysis in future). While Nielsen has panelists' personal information in their database (an agreement of panel membership), this was not communicated to the PI. Nielsen's privacy policy for panelists is outlined online (Nielsen, 2016).

Written evidence of informed consent was not used because the study was administered electronically and involved no more than minimal risk. Participants indicated their consent to the introductory letter by clicking the "Next" button, which routed them to the screener. Closing the web browser was taken as a withdraw given that participants were not permitted to save their survey to continue later. Participants were also instructed that they could contact the PI to request that their data be withdrawn.

To honour participants' time commitment, Nielsen awarded them an inducement (points) based on pre-existing arrangements. All individuals were given points for participating. If during the screener an individual was deemed ineligible for the survey, they were given a standard amount of points. For respondents who completed the survey, the number of points awarded was based on the length of their survey. Respondents can exchange their points in Nielsen's HIpoints online store for items such as gift cards, subscriptions, etc. Inducements were limited to a relatively small incentive to maintain the element of voluntariness.

The data was gathered using Qualtrics, which is a survey software tool for which UNB has a license. The data is stored on a Qualtrics server in Arizona as well as on the PI's secure computer for analysis purposes. The individuals who had access to the data before its public release included the PI, the PI's supervisor, and Nielsen. The dataset (not de-identified) was shared with Nielsen so that they could conduct the weighting to bring it in line with the census-balancing targets. This was approved by the Research

Ethics Board at UNB and both the PI and Nielsen signed a mutual confidentiality and non-disclosure agreement for this purpose.

For transparency and reproducibility reasons, following defence a de-identified version of the dataset (along with the SPSS code and other resources) will be publicly released on the Open Science Framework (OSF). Participants were notified of this in the letter of introduction. Given that zip code is one of the 18 Health Insurance Portability and Accountability Act (HIPAA) protected health information identifiers, this will be removed, along with respondent's identification number (RID) from Nielsen as it is a "unique identifying number," in any publicly accessible copies of the dataset to ensure it is properly de-identified (United States Department of Health and Human Services, 2003). Releasing data and code is becoming an increasingly important way to demonstrate transparency and allow scientific claims to be subject to outside assessment through reproducibility (Christensen, 2016, p. 5).

The same ethical protocols were followed for those who participated in the online field test. Formal informed consent for the cognitive interviewing participants was not necessary per UNB's Research Ethics Board. Because the PI recruited individuals for the cognitive interview and met with them in person, their personal identifying information (name, email and/or phone, etc.) was accessed and an audio recording of the conversation was made. None of this raw data will be publicly released nor shared with anyone outside of the dissertation committee. Participants have not been identified by name (or pseudonyms) in any reporting. Following defence, the data will be destroyed.

Funding was secured to cover the data collection costs, which totalled USD\$12,005. This was funded through three sources: 1) CAD\$4,000 from Nels

Anderson Field-Research Grant through the Department of Sociology at UNB; 2) USD\$4,000 in the form of a VegFund Merit Award; and 3) USD\$5,000 from a donor with fiscal sponsorship provided by Faunalytics (the PI's employer at the time the research was conducted).

For funding coming from outside of the university, terms of the funding agreement were discussed with each funder, including that: 1) the PI is obliged to follow appropriate requirements for sponsorship of research, notably that sponsors are not permitted to have a say over the results or direction of the research; 2) the PI retains independent control and authorship over the research and dataset and requires acknowledgement or inclusion in any publications stemming from it; and 3) the PI cannot guarantee any particular timeline for completion. The PI does not have any conflicts of interest that arose because of the funding agreements (or otherwise) to declare.

3.13 Data Collection

3.13.1 Quality Control

More than 20 iterations of test data simulated by Qualtrics as well as the pilot field data were reviewed to check for: missing data, out of range values, questions with little variance, path branching, randomization schemes, display logic, validations, forced response, quotas, end of survey points, respondent IDs, etc. As per the advice of Dillman, Smyth, and Christian (2014, pp. 346–348), a process for assessing data collection progress and quality was devised prior to launch so that if needed corrections could be made as soon as possible to minimize complications with the full dataset.

3.13.2 IR Check

The purpose of the IR check was to get estimates of the prevalence among the U.S. general population of the four groups in the survey: vegetarians, meat reducers, chicken avoiders, and non-reducing omnivores. Nielsen began the check on September 21, 2016, with an 18+ general population sample balanced on age/sex. They ran the IR check using 10 questions provided by the PI: the FFQ broken out into seven separate questions (given formatting limitations) and three confirmation checks on diet grouping. The results, calculated based on instructions from the PI, showed: 1.2% vegetarians, 23.7% meat reducers, 1.2% chicken avoiders, and 73.2% non-reducing omnivores. The remaining percentage represents suspends, i.e., respondents who stopped midway through the IR check.

3.13.3 Sampling

Nielsen fielded the survey to a general population sample 18+ years of age. Because of the size of the sample and the low IR, Nielsen was required to supplement their sample with vendor samples. This can cause some skews, though the partner panels used were fully vetted by Nielsen's panel team prior to use.

3.13.4 Router Allocation Process

ESOMAR's guidelines advise that a company's router allocation process should be inquired about given that "bias of varying severity may arise from the prioritization in choices of surveys to present to respondents and the method of allocation" (ESOMAR,

2012, p. 9). Nielsen confirmed that they would keep the allocation set to randomization rather than prioritization.³⁰

3.13.5 Invitations

To help limit self-selection bias, it was important that the invitation was not specific to the study in terms of relaying information on the topic, researcher, etc. Self-selection bias was, however, still possible once respondents reached the informed consent screen where they could break-off from the survey. However, only a very small proportion (0.9%) of respondents did so (288 out of 30,689 respondents in the original dataset). An anonymous link to the Qualtrics survey was provided to Nielsen to enable them to send the invitations to panelists. Nielsen's survey initiation read: "The latest survey is now open and we want your opinion! Complete the survey to earn points and trade them in for items in our catalog." There were no special measures taken to specifically target respondents with lower IRs. Rather, a general population was the target to ensure the ability to calculate accurate prevalence rates for the groups under study.

3.13.6 Census-Balancing

Census-balancing is used to improve a sample's ability to "reflect the basic demographics of the U.S. population" (Baker et al., 2010, p. 718). Census-balancing for this sample was based on non-interlocking quotas for: age by sex, region, education, race/ethnicity, and income. To conform with the demographic markers that Nielsen uses

³⁰ The use of a panel provider rather than a convenience sample notably decreased the risk of an over-representation of participants with shared characteristics due to the survey being shared among friends, family, etc. This was safeguarded against by way of Nielsen's use of a randomized process for router allocation, which prevents panel participants from self-selecting a survey of their choice to complete.

for census-balancing, participants were asked for their sex (in binary form) rather than their gender identity. It is recognized that there are more sensitive ways to ask these types of questions (American Sociological Association, 2015). Other demographic characteristics were also written to correspond with census-balancing targets. Census-balancing was based on screener completion, rather than “outgo,” i.e., the survey invitations.

The targets Nielsen provided (see the Census-Balancing section of the Results Chapter) have been used for several years and have become standard across their company. Along with the targets, Nielsen also provides lower and upper bounds within which they aim to have the targets fall during collection. These are between 0.5% and 3% for any one census-balancing category, which Nielsen says is an industry standard. Census-balancing was not achieved during fielding alone, notably because of the large sample size, which impacts overall feasibility. As such, the dataset was weighted prior to analysis. Certain target demographics are harder to reach—e.g., young males and those with less than a high school education—which is not unique to this research project. Importantly, this sample (and indeed any sample) should not be conceived of as an exact representation of the U.S. adult population, but rather an *estimate* of such.

To help improve the census-balancing, there was the option to include single source sample, i.e., real time intercept that is not from a double opt-in panel sample. Such an un-vetted sample source could be in the form of an “intercept sample” or part of a “single-sourced panel.” Such individuals decline to join a double opt-in panel but agree to partake in a single survey. They may come through pop-up Internet ads or other one-time offers online.

These samples are a source for low incidence populations that can be difficult to reach through traditional channels. This type of sample is becoming increasingly accepted in the market research community given that the ubiquity of technology has diminished the need to be part of a traditional online panel to participate in this type of research. It also wards against single source bias by allowing for a blend of samples. Nielsen normally advises capping single source sample at no more than 10% given that these respondents tend to answer differently, e.g., their placement on Likert scales.

Ultimately, the option to draw from un-vetted samples was not pursued due to concerns about changing the sampling method during data collection and because, even given such a move, census-balancing could not be guaranteed. As such, vetted double opt-in samples were used exclusively throughout the data collection process.

3.13.7 Response Rate

Nielsen offered to provide a response rate for the main study if the PI signed a non-disclosure agreement. This would have indicated how many individuals received an invitation but did not proceed to the survey. This was not pursued because Nielsen would have had to rely on direct mailings rather than routed traffic to achieve this. The sampling works such that if an individual is directly mailed for a specific study but do not qualify, they would be randomly routed to another study. Consequently, sourcing the sample through direct mailing only can impact the feasibility of data collection by removing a data source. A response rate was not ascertained due to concerns that tracking the response rates could affect census-balancing given that it would be more difficult to bring in harder-to-reach demographics who typically have very low response rates (e.g., young males) if only direct mailings were relied on. Additionally, narrowing

the data source could impact the fielding time of data collection, adding one to two weeks if not more to the total time in the field.

3.13.8 Randomization

To shrink the samples for meat reducers and non-reducing omnivores, it was necessary to have informed estimates of the prevalence of these groups in the U.S. population. To set up the initial randomization scheme, Nielsen's IR check was used rather than the IRs from the field test because the former was based on a larger sample size. Nielsen's IR check estimates ended up differing from the prevalence uncovered in the main study and so it was necessary to repeatedly monitor the prevalence rates during data collection and to adjust the proportion of individuals being randomized out of the survey in real time.

The possibility exists that speeding up or slowing down this flow somewhat skewed the demographic make-up of the groups. For example, bias could have resulted if a larger proportion of the sample was admitted early and those first out of the gate differed in notable ways in terms of demographics characteristics from those who responded later. Such discrepancies were examined by comparing the demographic data of groups assigned using the randomization scheme. The Randomization section of the Results Chapter shows that there were no statistically significant demographic differences between meat reducers who proceeded to the full survey and those who were randomized out. There were, however, statistically significant differences in education between omnivores who proceeded to the survey and those who were terminated. Statistically significant differences also existed for age by sex and region among the three non-reducing omnivore groups. These dissimilarities present limitations.

Meat reducers were randomly assigned to proceed to the full survey or to one of the end of survey termination points. Based on Nielsen's IR check, at launch there was one option to proceed for every 18 end of survey termination points, or a 5.3% (1 in 19) advancement rate. To be responsive to the changing real-time IR counts, this figure was adjusted often during data collection with the final programming including one option to proceed with 44 end of survey termination points, or a 2.2% (1 in 45) advancement rate. The average advancement over the course of data collection was 4.0% (327 meat reducers proceeding out of 8,102). The assignment within these blocks was random such that it was not the case that every Nth meat reducer proceeded, rather Qualtrics' "Evenly Present Elements" feature ensured each of the elements would be displayed an equal amount of times regardless of the order in which they appeared.

Non-reducing omnivores were randomly assigned to one of three groups: 1) the vegetarian diet path; 2) the reduced-meat diet path; or 3) the chicken-free diet path. Following this, a similar randomization scheme as that for meat reducers was used, with the exception that at launch there was one option to proceed for every 19 end of survey termination points, or a 5.0% (1 in 20) advancement rate within each group. Again, to be responsive to the changing real-time IR counts, this figure was adjusted frequently during data collection with the final programming for each group allowing one option to proceed and 32 end of survey termination points, or a 3.0% (1 in 33) advancement rate within each group. The average advancement over the course of data collection was 5.4% (969 non-reducing omnivores proceeding out of 17,843).

3.13.9 Quotas

When the survey launched, quotas for the five demographic targets were in place to help ensure the demographics stayed within range. These were later removed when it became clear that it was not possible for Nielsen to bring all census-balancing targets within range and that post-collection weighting would be used as a corrective measure. Nielsen helped control the quotas on their end through sampling procedures. Because of difficulties with census-balancing, the education quota was met part way through data collection. A few respondents falling in the over-quota group (having a degree) were not permitted to proceed until the quota could be adjusted. Quotas were initially set up to ensure the number of completes in each of the six paths was not exceeded as well. These too were later removed and the groups allowed to fall out naturally or per the randomization scheme.

3.13.10 Soft and Full Launch

Data collection began on October 5, 2016, and the soft launch ran until the following day. The collection was paused after a certain number of responses to ensure there were no problems with the platform or dataset before proceeding to the full launch. The soft launch took in 993 individuals (which may have included duplicates). A variety of checks were completed on this dataset including examining the termination points, break-offs, the randomization scheme, the screener completion rate, full completes and the number in each of the six paths, out of range values, open-text answers, the speed warning and termination, the IMC and attention check, duplicate and missing RIDs, completion time, and the IR.

After the soft launch, the full launch began on October 7, 2016. A total of 23 separate checks were completed on partial iterations of the dataset during the full launch. These checks followed the same pattern as those conducted during the soft launch and included frequent check-ins with Nielsen to discuss progress on census-balancing.

3.14 Data Analysis

3.14.1 Pre-Analysis Plan

As a transparency measure to guard against publication bias (Christensen, 2016, pp. 5–6), the analyses in this dissertation were based on a pre-analysis plan preregistered on publicly available pages on the Center for Open Science’s OSF. The plan was registered the day the official data collection began, which classified it as a “registration prior to accessing the data.” On October 5, 2016, the pre-analysis plan along with supporting documents were uploaded to the OSF project page that was set up for the dissertation (Asher, 2016a). These were also more formally preregistered with the Center for Open Science’s Preregistration Challenge on a page set up for that purpose (Asher, 2016c). The proposed statistical methods and analyses were subsequently reviewed by the Center for Open Science to ensure they provided sufficient detail and were in line with eligibility requirements. A few revisions were required, after which the preregistration was archived by the Center for Open Science in a read-only format on October 27, 2016.

The OSF pages were made private on Oct 10, 2016 to prevent study participants from being able to source information online about the study prior to completing the survey. Once the fielding was complete, these pages were made public again on

November 7, 2016, which also coincided with the end of the embargoed registration with the Center for Open Science, which was put in place as a safeguard during fielding.

The pre-analysis plan was meant to serve as a rough framework for how the data was expected to be approached. The plan noted the possibility of changes (minor or major) once the analysis began. There were several instances where deviations from the plan were needed, most notably for the approach to the pairwise comparisons after the ANOVAs, which is explained under the Post Hoc Tests section of this chapter. For this, pairwise comparisons (Hochberg's GT2 or Games-Howell) were used in place of *t*-tests to address concerns regarding the familywise error rate. This involved adjusting the significance level for each test to ensure the overall Type I error rate did not exceed 0.05.

3.14.2 Statistical Software Package

Analyses were conducted using IBM's Statistical Package for the Social Sciences (SPSS), Version 24. The dataset was downloaded in SPSS format from the Qualtrics survey platform.

3.14.3 Weighting

The data was weighted to ensure appropriate census-balancing for the U.S. adult population. For this, a new variable was created for each respondent where, "the weight can be interpreted as the number of individuals in the target population represented by the sample respondent" (Biemer & Christ, 2008, p. 317). In this survey, the target (or inferential) population is adults 18 years of age and over in the U.S. The goal of weighting was to allow the survey sample to be used to make basic inferences about the

target population (Biemer & Christ, 2008, pp. 318–319). Weighting that employs “case weights to assure that sample totals equal some external total based on the target population” is known as poststratification weighting (Groves et al., 2009, p. 352).

There is a notable difference between probability and nonprobability-based samples. This research used the latter. The term “representative” is often used to describe samples that come from probability-based samples, while in contrast, nonprobability samples are thought of less as representative of the general population and more as demographically similar (Baker et al., 2010, p. 747).

As Pasek notes, generalizability is not guaranteed for online opt-in nonprobability samples, which limits the extent to which these samples can be used to mirror attitudes and behaviours among the public (2016, p. 269). Indeed research has found that surveys done with probability samples produce more accurate results than those with nonprobability-based samples even with the use of post-stratification demographic weighting, which improve “the overall accuracy of some of the nonprobability sample surveys but decreased the overall accuracy of others” (Yeager et al., 2011, p. 709).

This research is primarily interested in making two types of inferences: the distribution of variables in society and the relationship between variables (Pasek, 2016, p. 270). There is conflicting evidence about the extent to which opt-in online nonprobability-based samples employing population targets can accurately reflect the population point estimates for attitudes and behaviours in society found in probability-based research. For the most part, research has found sizeable differences, which suggests that “nonprobability methods appear poorly suited to population description,” though there are some weighting approaches that can improve this (Pasek, 2016, p. 271).

It has been found that “breadth of sample, and demographic weighting alone may be insufficient to expect nonprobability modes to yield the same conclusions as probability samples” for point estimates (Pasek, 2016, p. 283). This represents a limitation of this research, particularly for the estimates of the various diet groups among the American adult population. Encouragingly, differences between probability and nonprobability samples have less of an impact on inferences about how variables relate to one other (Pasek, 2016, pp. 271, 283).

Prior to weighting, the PI dialogued with Nielsen to ensure the data cleaning procedures both before and those expected after weighting were sound. Nielsen weighted the dataset using all five demographic characteristics, the standard set of variables they use for all weighting projects with a general population sample. The targets used are listed under the Representativeness section of the Results Chapter. An adjustment was made to the census-balancing given that Associate Degree was in “HS Degree to less than College Degree” for Nielsen’s targets, but in “College degree (associate, bachelor’s, master’s, or doctorate)” in the survey. The weighting was based on the latter to ensure the targets and the survey data matched.

During weighting, Nielsen strove for a balance between representing the target population correctly and using the statistical power of the data efficiently knowing that the two may conflict (Nielsen, n.d.-a, p. 2). During the weighting process, groups can be weighted up, i.e., “groups in the sample that are ‘too small’ (or under-represented) are pulled or stretched to match their size in the population (weight value is *usually* greater than 1)” or they can be weighted down, i.e., “groups that are ‘too large’ (or over-represented) are pushed down or compressed to match their size in the population (weight value is *usually* less than 1)” (Nielsen, n.d.-b, p. 7).

Nielsen typically employs rim weighting, which ensures that “each individual cell within a sample is proportional to the population (for example age, education, and ethnicity), however, the joint distributions of selected cells (for instance education by ethnicity) *may not* match the population of interest” (Nielsen, n.d.-b, p. 12). This is in contrast to cell weighting, which ensures a match on both the individual cell and the joint distributions level (Nielsen, n.d.-b, p. 12). Rim weighting was used for these purposes because while census-balancing targets were known for each of the five demographic characteristics separately, interlocking targets were not part of the balancing scheme. In other words, the targets for the various characteristics were known rather than “the relationship of the various combinations of those characteristics” (IBM, n.d.-a).

The weighted dataset had one weighting variable, which was applied using SPSS’s weight cases function. Each of the 26,488 respondents in the dataset were assigned a weighting value where “each weight value represents how many respondents that particular observation should count as, in order to make the data representative” (Nielsen, n.d.-b, p. 8). The maximum respondent rim weight was 5.000000, while the minimum was 0.280089.

As Nielsen explains, “as the rim weighting process runs, it tries to distort each variable as little as possible while still trying to attain all of the desired proportions among the characteristics” (IBM, n.d.-a). The rim weighting efficiency was 65.1%, which indicates the degree to which the sample is well balanced. The higher the efficiency, the better the balancing of the sample given that “if the data for many respondents needs to be weighted heavily up or down, the efficiency percentage will be low” (IBM, n.d.-b).

The weighted and unweighted figures as well as the final weights are presented in Table 4. The most extreme weights were 0.6945 for household income of \$25,000 to \$34,999, and 2.4678 for education of less than a high school degree. None of the maximum element weights exceeded 3.0 or were less than 0.5, which are key thresholds for Nielsen.

Table 4. Weighted and Unweighted Targets and Weights Applied

Demographic Characteristics		Weighted	Unweighted	Weights
Age by Sex	Female 18-24	6.24	6.75	0.9240
	Female 25-34	8.97	11.33	0.7920
	Female 35-44	8.48	10.59	0.8012
	Female 45-54	9.09	11.28	0.8061
	Female 55-64	8.78	10.42	0.8430
	Female 65+	10.71	12.82	0.8356
	Male 18-24	4.82	2.01	2.4021
	Male 25-34	8.77	5.43	1.6169
	Male 35-44	8.13	5.46	1.4909
	Male 45-54	8.63	5.95	1.4489
	Male 55-64	8.47	8.48	0.9980
	Male 65+	8.89	9.48	0.9376
Region	Northeast	18.05	18.41	0.9804
	South	37.30	36.73	1.0155
	Midwest	21.41	23.83	0.8982
	West	23.24	21.02	1.1054
Education	Less than high school degree	7.94	3.22	2.4678
	High school degree to less than college degree	50.98	54.04	0.9434
	College degree or more	41.08	42.74	0.9611
Race/Ethnicity	Hispanic	15.14	8.66	1.7491
	Black (Not Hispanic)	11.68	8.55	1.3654
	Asian (Not Hispanic)	5.58	2.59	2.1514
	All Other (Not Hispanic)	67.60	80.20	0.8429
Household Income	\$14,999 or less	8.78	10.85	0.8087
	\$15,000 to \$24,999	8.61	11.65	0.7386
	\$25,000 to \$34,999	8.85	12.74	0.6945
	\$35,000 to \$49,999	12.49	15.38	0.8118
	\$50,000 to \$74,999	17.88	20.38	0.8771
	\$75,000 to \$99,999	13.15	13.54	0.9712
	\$100,000 or over	30.25	15.45	1.9583

3.14.4 Data Cleaning & Coding

Data cleaning, or editing, is the process of “cleaning data and removing obvious mistakes” (Groves et al., 2009, p. 366). A variety of data cleaning measures were taken, both in real-time and following data collection, to remove data that added error or bias to the dataset.

Surveys are subject to issues due to missing values. This can stem from unit nonresponse, which occurs when an invited participant does not respond to the survey, and from item nonresponse, which arises when respondents answer some but not all of the survey questions (Rässler, Rubin, & Schenker, 2008, p. 370). There are four common procedures for handling missing data, which come with advantages and disadvantages: 1) less sophisticated methods such as complete-case analysis or available-case analysis, which concern only the respondents with complete data in general or for specific variables of interest; 2) weighting methods that assign a weight to complete units using information on all cases in the survey; 3) imputation and multiple imputation which assign values to missing data using other available information; and 4) direct analysis of incomplete data using model-based approaches (Rässler et al., 2008, pp. 370–371 & 373). There are also three ways to classify missing data cases: Missing Completely At Random (MCAR), Missing At Random (MAR), and Not Missing At Random (NMAR) (Rässler et al., 2008, p. 371).

Full incompletes (considered to be unit nonresponse if the screener was not completed) were removed from the dataset because every question in the screener was deemed necessary to ensure a respondent qualified for inclusion in the study. Respondents with item incompletes (i.e., item nonresponse that occurred past the screener) were not removed because there may be certain types of participants (e.g.,

those with lower socio-economic status) who disproportionately do not finish the survey and removing them could bias the data. This also guarded against engaging in data cleaning that would decrease the sample size unnecessarily. Although it is not considered a robust procedure for handling missing data, available-case analysis—which concerns only the respondents with complete data for specific variables of interest—was used. Procedures were not used to impute missing data as this can be difficult to execute properly.

Certain types of terminations, i.e., data cleaning, were conducted in real time during the screener. This entailed removing respondents who: 1) indicated they were under 18 years of age; 2) provided inconsistent answers to the diet verification questions, which is referred to as consistency editing (Groves et al., 2009, p. 345); 3) failed the affirmation check after the IMC; 4) had an unusually fast completion time for the screener (i.e., speeders); and 5) were in an over-quota demographic group. These individuals were manually removed from the dataset prior to analysis. To ensure there was no drop in the sample size, fielding continued until the desired sample size was reached.

Prior to analysis, respondents with duplicate RIDs were removed, as were respondents who did not have an identification number because their identity as a panelist could not be confirmed. The protocol used was to keep the first instance of a duplicate RID in all cases, which resulted in the second, third, etc., attempts being removed. It is possible that there were cases where it would have been better to remove the first instance, e.g., if someone closed their browser by mistake (an accidental break-off) and re-entered the survey to retake it. However, for respondent quality reasons, it

was decided to be best to err on the side of caution and use a common approach rather than having a series of different protocols for duplicates.

Nielsen disabled a setting that allowed “suspends” back into the survey, i.e., participants who started but did not complete the survey. However, duplicates still occurred in practice. Steps were taken on the Qualtrics platform to try to block participants from taking the survey more than once using the “Prevent Ballot Box Stuffing” feature, however this would not serve as a safeguard if a respondent cleared the cookies in their browser before re-entering.

Although these were given consideration, the following types of data cleaning were *not* ultimately undertaken: 1) respondents who did not complete a pre-determined percentage of the full survey once out of the screener); 2) respondents who failed additional internal reliability checks because of providing inconsistencies across answers; 3) respondents with excessive straightlining on grids; and 4) respondents who provided illegible or off-topic comments for open-ended questions.

Before analysis began, steps were taken to recode existing variables with new value labels, and to create new variables that merged data from multiple variables or that collapsed data within variables. Because the dataset will be publicly released, it was important to ensure the codebook and related information on variable re-coding and construction was well documented.

3.14.5 Dataset Iterations

The original dataset downloaded from Qualtrics had 30,689 respondents prior to any data cleaning. This dataset is labelled “Dissertation (Full Sample).sav.” The sample was cleaned by first removing respondents with missing or duplicate RIDs as well as those

deemed poor quality on a first pass. Following this, the dataset was reduced to include only those who completed the screener, leaving 26,488 individuals in the dataset labelled “Dissertation (Screened Sample).sav.” The flow chart for this can be found in APPENDIX D – Dataset Flow Charts. This dataset was used by Nielsen to devise a weighting variable, and is labelled “Dissertation (Weighted Sample).sav.”

After the weighting variable was created, other respondent quality issues were detected that needed to be addressed, specifically removing vegetarians who indicated they ate meat in the meals-based question as well as current meat restrictors who indicated “zero” for their length of adherence. This resulted in a sample size of 26,468 (unweighted) and 26,466 (weighted). The MOE for the weighted sample is +/- 0.6% (i.e., $0.95 / \sqrt{n \times 100}$). The corresponding dataset is labelled “Dissertation (Weighted Cleaned Sample).sav” and the flow chart is also in APPENDIX D – Dataset Flow Charts. Ideally these individuals would have been identified prior to weighting, however given the small number of respondents removed (20 individuals) and the fact that the census-balancing did not markedly change, this should not present a limitation.

The final data cleaning also removed speeders. This resulted in a sample size of 26,454 (unweighted) and 26,443 (weighted). The dataset was reduced to include only those who were part of one of the six paths, leading to 1,817 respondents (unweighted) and 1,793 (weighted). The MOE for the weighted sample is +/- 2.2%. The corresponding dataset is labelled “Dissertation (Frozen Analytic Sample).sav” and the flow chart is in APPENDIX D – Dataset Flow Charts. Speeders were identified by looking for unusually fast completion times. This was not specified in the pre-analysis plan, however upon examining the completion times it was deemed important post-hoc. Given the small

number of respondents removed (14 individuals), this is not thought to represent a notable deviation from the pre-analysis plan.

Given that the survey lengths differed by path, the median completion time was calculated for each of the six paths. Any individual who had a completion time less than a third of the median was removed. Unusually fast completion times were a concern because they may suggest that respondents were speeding to redeem the incentive and not reading the questions in the process, which can affect data quality. The concern was for the data quality in the main survey (as opposed to diet classification in the screener) since these individuals were not terminated for speeding during the screener.

It was not possible to do speeding checks for respondents who broke-off before completing the survey because completion time was only available for those who completed the survey. However, these break-offs only represent a small proportion of the sample. There were no measures taken to remove those with very long completion times because respondents may have simply left their browser open to later return to the survey, which was not thought to pose a notable threat to data quality. However, there was a cap (four hours) on how long respondents could keep the survey active before partial responses were closed.

Importantly, different versions of the datasets have been used to produce the findings in the next chapter. The biggest distinction is that the prevalence rates for the four groups were calculated using “Dissertation (Weighted Cleaned Sample).sav” because the threshold was lower to be counted in this regard than to have data retained for the main survey’s dataset “Dissertation (Frozen Analytic Sample).sav”. For instance, the six poor quality respondents were removed from the weighted cleaned sample because they indicated they misclassified their diet or that their data was not reliable,

and there was no way of being sure the latter did not apply to the diet questions. However, the 14 speeders in the main survey were not removed until after the prevalence for the diet groups were calculated because these individuals did not fail the speeding screener test so there was more confidence in their answers to the screener than to the main survey questions.

3.14.6 Population Estimates

Population estimates from the U.S. Census Bureau are required to answer several of the research questions. The most relevant is the estimate of the resident population 18 years and over for the U.S. (the focus of the survey sample) for October 2016 (the month the bulk of the data was collected).³¹ However, at the time of writing the bureau did not yet have estimates for the population 18 years of age or older as of October 1, 2016. This was calculated as outlined in Table 5.

Table 5. U.S. Population Estimates for 18 Years and Over³²

Estimate of total resident population for the U.S., July 1, 2016*	323,127,513
Estimate of resident population age 18 years and older for the U.S.,	249,485,228

³¹ One limitation is that future potential impact calculations presented in this document use the 2016 population estimates rather than some future estimated population size.

³² Figures with a single asterisk (*) come from (United States Census Bureau, 2016a), sourced January 9, 2017 as follows: <https://www.census.gov/programs-surveys/popest.html> —> Vintage 2016 Tables —> 2016 —> National Population by Characteristics Tables: 2010-2016 —> Population Estimates by Age (18+): July 1, 2016 —> Estimates of the Total Resident Population and Resident Population Age 18 Years and Older for the United States, States, and Puerto Rico: July 1, 2016 —> <https://www2.census.gov/programs-surveys/popest/tables/2010-2016/state/detail/SCPRC-EST2016-18+POP-RES.xlsx> (SCPRC-EST2016-18+POP-RES.xlsx). The figure with a double asterisk (**) come from (United States Census Bureau, 2016b), sourced January 9, 2017 as follows: <https://www.census.gov/programs-surveys/popest.html> —> Vintage 2016 Tables —> 2016 —> National Population Totals Tables: 2010-2016 —> Monthly Population Estimates —> Monthly Population Estimates for the United States: April 1, 2010 to December 1, 2017 (NA-EST2016-01) —> <https://www2.census.gov/programs-surveys/popest/tables/2010-2016/national/totals/na-est2016-01.xlsx> (na-est2016-01.xlsx). Here and elsewhere, the procedure for accessing U.S. government documents is important to fully document because the URLs change frequently.

Estimate of total resident population for the U.S., July 1, 2016*	323,127,513
July 1, 2016*	
Proportion of the resident population age 18 years and older for the U.S., July 1, 2016*	77.2%
Estimate of resident population for the United States, October 1, 2016**	323,778,180
Estimate of resident population 18 years and over for the United States, October 1, 2016 (calculated by using the 77.2% figure with the above figure)	249,956,755

3.14.7 Pearson's Chi-Square Test

Pearson's chi-square test was used to explore associations between categorical variables. All tests performed met the assumption of independence and no cells had expected counts less than five (Field, 2009, pp. 691–692). Effect sizes were reported using Cramer's V (as opposed to phi) because there were no instances where both variables had no more than two categories each (Field, 2009, pp. 698–699). Both statistics lie between zero and one, and can be interpreted similar to a correlation coefficient where 0.10 is a small effect, 0.30 is a medium effect, and 0.50 is a large effect (Field, 2009, pp. 57, 697–698).

3.14.8 ANOVAs & Pairwise Comparisons

An independent one-way ANOVA was run when means for three independent groups were being compared. The one-way ANOVA tests the null hypothesis of equality of means for more than two groups by producing an F -ratio, which “is a measure of the ratio of the variation explained by the model and the variation explained by unsystematic factors” (Field, 2009, p. 358). The one-way ANOVA is said to be an omnibus test because it “examines all the comparisons in the study as a set” (Warner, 2013, p. 220). Because the groups in this study are independent—i.e., participants do not belong to more than one group and are not matched or paired—the one-way ANOVA is referred to

as a between-subjects test (Warner, 2013, p. 219). ANOVA is generally thought to be a robust test such that if assumptions are not met it is still considered accurate, however this is not always the case (Field, 2009, p. 359). Assumptions of ANOVA and how they are treated in this study are discussed below.

3.14.8.1 Measurement Level

The assumption is that, “the scores on the quantitative dependent variable should be quantitative and, at least approximately, interval/ratio level of measurement” (Warner, 2013, p. 221). As is common practice, variables with 5-point Likert scales were treated as continuous. As Agresti and Finlay (1999, p. 440) note:

“when an ordinal response has several categories, however, it is common in practice to assign scores on its levels and treat it as a quantitative variable. This is a reasonable strategy when primary interest focuses on an overall measure of central tendency such as the mean rather than the proportions in particular categories.”

3.14.8.2 Independence

ANOVAs assume that, “observations should be independent of each other, both within groups and between groups” (Warner, 2013, pp. 221–222). This assumption was met in all instances.

3.14.8.3 Distribution

ANOVAs assume that the distribution within groups approximates normality (Field, 2009, p. 359). Jackson (2010, p. 174) notes that, “because ANOVA is a robust statistical test, violations of some of these assumptions do not necessarily affect the results. Specifically, if the distributions are slightly skewed rather than normally distributed, it does not affect the results of the ANOVA.” Likewise, Agresti and Finlay (1999, p. 473) explain that:

“moderate departures from normality of the populations can be tolerated, in the sense that the F sampling distribution still provides a good approximation to the actual sampling distribution of the test statistics. This is particularly true for larger sample sizes, since the sampling distributions then have weaker dependence on the form of the population distribution.”

Agresti and Finlay (1999, pp. 440 & 474) cite sample sizes nearing 300 as being sufficiently large in one example they provide, which is in the range of the sample sizes in this study. As such, the normality assumption is not considered critical for these purposes and ANOVAs are employed rather than their non-parametric equivalent the Kruskal-Wallis test (Agresti & Finlay, 1999, p. 474; Field, 2009, p. 391).

3.14.8.4 Variance

The ANOVA test assumes that the variances across groups are approximately equal (Warner, 2013, p. 221). Levene’s test can be used to determine this (Warner, 2013, p. 222). If the variances are significantly different this can be corrected by transforming the values. However, for these purposes—given that transformation are not always helpful (Field, 2009, p. 382)—when Levene’s test showed the assumption of homogeneity of variance was violated an alternative F -ratio (Welch’s F) was used, which is robust in the absence of homogeneity of variance (Field, 2009, pp. 361 & 380). Welch’s F is used instead of the Brown and Forsythe F -ratio because the former performs better in terms of power, i.e., in detecting an effect when one is present (Field, 2009, pp. 361 & 380).

3.14.8.5 Post Hoc Tests

While an ANOVA is able to detect an effect, it cannot specify the nature of the effect, which is why follow-up analyses are required (Field, 2009, p. 349). Because no specific a priori hypotheses were generated for this study, post hoc tests as opposed to planned

comparisons were used to determine which groups differ by looking at all possible pairwise comparisons (Field, 2009, pp. 361 & 372). Unlike *t*-tests, the pairwise comparisons address concerns regarding the familywise error rate by adjusting the significance level for each test to ensure the overall Type I error rate does not exceed 0.05 (Field, 2009, pp. 361 & 372).

There are three things to consider when selecting a post hoc test: “(1) does the test control the Type I error rate; (2) does the test control the Type II error rate (i.e. does the test have good statistical power) and (3) is the test reliable when the test assumptions of ANOVA have been violated?” (Field, 2009, pp. 361 & 373). The first two points are connected in that, “if a test is conservative (the probability of a Type I error is small) then it is likely to lack statistical power (the probability of a Type II error will be high)” and likewise “if a test is too conservative then we are likely to reject differences between means that are, in reality, meaningful” (Field, 2009, pp. 361 & 374).

Of the more common post hoc tests, the least-significant difference (LSD) test was not used because it does not control the Type I error (Field, 2009, pp. 361 & 374). Bonferroni was also not employed because it is a very conservative test (Field, 2009, p. 374; Jackson, 2010, pp. 158–159; Warner, 2013, p. 243). The Ryan, Einot, Gabriel and Welsch Q procedure (REGWQ) was not used because it does not perform well when group sizes differ (Field, 2009, pp. 361 & 374), nor does Tukey’s honestly significant difference (HSD) (Jackson, 2010, p. 175). For both classifications of diet groups (current meat restrictors and non-restrictors) sample sizes differ, though not drastically so.

The following guidelines from Field (2009, pp. 374–375) were used to select the post hoc tests:

“When you have equal sample sizes and you are confident that your population variances are similar then use REGWQ or Tukey as both have good power and tight control over the Type I error rate. [...] If sample sizes are slightly different then use Gabriel’s procedure because it has greater power, but if sample sizes are very different use Hochberg’s GT2. If there is any doubt that the population variances are equal then use the Games-Howell procedure because this generally seems to offer the best performance.”

All sample sizes were considered more than slightly different. As such, when there was greater certainty that the population variances were equal (i.e., when Levene’s test for the assumption of homogeneity of variance did not fail), Hochberg’s GT2 procedure was used to make all possible pairwise comparisons. When there was uncertainty that the population variances were equal (i.e., when Levene’s test for the assumption of homogeneity of variance failed) Games-Howell was used to make all possible pairwise comparisons. Note that it is possible to have a statistically significant *F*-ratio in the ANOVA without any significant findings in the post hoc pairwise comparisons because the latter are more conservative (Warner, 2013, p. 245).

In addition to reporting the findings from the ANOVA and pairwise comparisons, the effect sizes (in this case denoted by *r*) were documented as well, which is “an objective and (usually) standardized measure of the magnitude of observed effect” (Field, 2009, p. 56). Effect sizes were calculated by taking the square root of the between groups sum of squares divided by the total sum of squares (i.e., the between-group effect over the total variance) (Field, 2009, pp. 361 & 389). The *r* effect size is Pearson’s correlation coefficient, which ranges from 0 to 1, with 0 indicating no effect and 1 indicating a perfect effect (Field, 2009, p. 56). An effect size of $r \geq 0.1$ is small, $r \geq 0.3$ is medium, and $r \geq 0.5$ is large (Field, 2009, p. 57). The effect size *r* can be calculated by taking the square root of the model sum of squares (SS_M) divided by the

total sum of squares (SS_T), in other words the square root of the between-group effect over the total variance in the data (Field, 2009, pp. 356 & 389).

3.15 Concluding Summary

This chapter discussed the dissertation's methodology, which involved collecting data on the Qualtrics platform from an online census-balanced cross-sectional sample of more than 30,000 U.S. adults 18+ years of age provided by Nielsen in the fall of 2016. Six groups of respondents were isolated in this sample. This chapter detailed background information including the cross-sectional design, the specifics of administering a web survey, how the three diets were operationalized, the use of sample size projections, the experimental component, and programming features. The study materials were discussed with specifics for each of the measures used in the study. The process of securing external feedback, pilot testing, and ethical protocols was also explained. A thorough consideration of the data collection process along with its complexities was offered and the chapter closed with a discussion of the data analysis procedures.

4.0 RESULTS

This chapter begins by discussing several characteristics of the dataset including the extent to which the sample is census-balanced, imbalances stemming from the randomization scheme, nonresponse bias arising from differences between completers and non-completers in the screener, and the demographic characteristics of the four populations under study.

The bulk of the chapter presents the findings³³ of the eight indicators used in the survey: 1) prevalence and opinion leaders (current impact); 2) prevalence and opinion leaders (future potential impact); 3) meat-free meals (current impact); 4) meat-free meals (future potential impact); 5) farmed animals (current impact); 6) farmed animals (future potential impact); 7) external perceptions (future potential impact); and 8) internal experiences (current impact).

The results show that a reduced meat diet outperformed the other diets on the first four indicators as well as on external perceptions (operationalized in terms of familiarity, social ties, an attitude thermometer, intentions, attitudes, perceived behavioural control, subjective norms, SWFL, convenience, social/personal life, health, cost, motivation, identity, and the perception of the prevalence rate). The internal experiences indicator was the one exception, where the vegetarian diet surpassed the others (operationalized in terms of SWFL, social ties, intentions, attitudes, perceived behavioural control, subjective norms, convenience, social/personal life, health, cost, motivation, identity, the perception of the prevalence rate, length of diet adherence, and

³³ Note that some numbers in this chapter may not appear precise due to rounding.

diet lapses). There were no indicators on which the chicken-free diet outperformed the others. Because of discrepancies with the FFQ data, the two farmed animal indicators were not able to be evaluated. The chapter closes by reviewing findings specific to chicken avoiders.

4.1 Census-Balancing

The sample was nonprobability-based, meaning it was census-balanced to approximate the demographic make-up of the U.S. population 18 years of age and older. The balancing was undertaken using five demographic characteristics—age by sex, region, education, race/ethnicity, and household income—per targets provided by Nielsen based on U.S. census figures. Table 6 shows the balancing of the original sample compared to the weighted and cleaned sample (respondents who proceeded past the screener). Demographic characteristics for the weighted and cleaned sample were better able to approximate the make-up of the U.S. population. Nonetheless, two targets did not closely align with Nielsen’s lower (0.5%) and upper bounds (3%) for the census targets: males 18–24 years and less than high school degree. Having Nielsen correct this through weighting would have jeopardized the integrity of the sample and so was not pursued.

Table 6. Census-Balancing

Demographic Characteristics		Full Sample (<i>n</i> = 30,689, and 29,959-30,309 for demographics) (%)	Weighted, Cleaned Sample Leaving Screener (<i>n</i> = 26,466) (%)	U.S. Quotas from Nielsen’s Census-Balancing Targets (%)
Age by Sex	Female 18-24	6.9	6.2	6.2
	Female 25-34	11.3	9.0	8.9
	Female 35-44	10.7	8.5	8.4
	Female 45-54	11.3	9.1	9.0
	Female 55-64	10.3	8.8	8.7

Demographic Characteristics		Full Sample (<i>n</i> = 30,689, and 29,959-30,309 for demographics) (%)	Weighted, Cleaned Sample Leaving Screener (<i>n</i> = 26,466) (%)	U.S. Quotas from Nielsen's Census-Balancing Targets (%)
Region ³⁴	Female 65+	12.5	10.7	10.6
	Male 18-24	2.1	4.8	6.3
	Male 25-34	5.6	8.8	8.8
	Male 35-44	5.6	8.1	8.1
	Male 45-54	5.9	8.6	8.6
	Male 55-64	8.4	8.5	8.0
	Male 65+	9.4	8.9	8.4
	Northeast	18.6	18.1	18.1
	South	36.9	37.3	37.2
	Midwest	23.5	21.4	21.3
Education	West	21.0	23.2	23.4
	Less than high school degree	3.6	7.9	12.2
	High school degree to less than college degree	54.4	51.0	48.7
Race/Ethnicity	College degree or more	42.0	41.1	39.1
	Hispanic	9.0	15.1	15.5
	Black (Not Hispanic)	9.1	11.7	11.7
	Asian (Not Hispanic)	2.7	5.6	5.7
	All Other (Not Hispanic)	79.2	67.6	67.1
Household	\$14,999 or less	11.6	8.8	8.8

³⁴ Region of the U.S. was calculated using the state provided by respondents, with the following breakdown: Northeast (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont); Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin); South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia); and West (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming). (United States Census Bureau, n.d.-b) sourced January 9, 2017 as follows: <https://www.census.gov> —> Geography —> Maps & Data —> Reference —> General Reference Maps —> Census Regions and Divisions of the United States —> http://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf.

Demographic Characteristics		Full Sample ($n = 30,689$, and 29,959-30,309 for demographics) (%)	Weighted, Cleaned Sample Leaving Screener ($n = 26,466$) (%)	U.S. Quotas from Nielsen's Census-Balancing Targets (%)
Income	\$15,000 to \$24,999	11.8	8.6	8.6
	\$25,000 to \$34,999	12.7	8.8	8.8
	\$35,000 to \$49,999	15.3	12.5	12.5
	\$50,000 to \$74,999	20.3	17.9	17.8
	\$75,000 to \$99,999	13.3	13.1	13.1
	\$100,000 or over	15.1	30.3	30.5

4.2 Randomization

The samples devised through randomization were examined for imbalances. For meat reducers, Pearson's chi-square test revealed no instances of a significant difference in the demographic characteristics of the samples resulting from the randomization scheme. There was one discrepancy in the demographic characteristics resulting from the non-reducing omnivore randomization: there was a significant association between the omnivore samples for education $\chi^2 (2) = 9.269$, $p < 0.01$, Cramer's $V = 0.02$ (a very small effect). See Table 7.

Table 7. Demographic Characteristics of Samples for Meat Reducers and Omnivores Devised Through Randomization from the Weighted Cleaned Sample Leaving the Screener

Demographic characteristics		Meat reducers (sub-sample) (<i>n</i> = 329) (%)	Meat reducers (entire sample minus sub-sample) (<i>n</i> = 8,407) (%)	chi - sq.	Non-reducing omnis (sub-sample) (<i>n</i> = 934) (%)	Non-reducing omnis (entire sample minus sub-sample) (<i>n</i> = 16,242) (%)	chi - sq.
Age by Sex	Female 18-24	5.8	6.8		6.7	5.8	
	Female 25-34	7.9	7.9		10.5	9.4	
	Female 35-44	6.1	7.0		8.6	9.2	
	Female 45-54	10.9	7.5		8.5	9.9	
	Female 55-64	8.2	9.6		8.0	8.4	
	Female 65+	12.5	11.9		10.7	10.0	
	Male 18-24	4.3	6.0		5.5	4.1	
	Male 25-34	11.2	12.2		5.9	7.2	
	Male 35-44	8.2	8.2		8.4	8.2	
	Male 45-54	6.7	7.2		9.6	9.4	
	Male 55-64	10.6	7.5		8.7	9.0	
	Male 65+	7.6	8.2		9.0	9.2	
	Region Northeast	16.4	18.8		19.1	17.6	
	South	37.7	37.5		39.3	37.2	
	Midwest	20.1	18.2		21.3	23.1	
	West	25.8	25.5		20.3	22.1	
Education	Less than high school degree	8.2	8.8		10.0	7.4	**
	High school	46.4	48.2		52.9	52.8	

Demographic characteristics		Meat reducers (sub-sample) (<i>n</i> = 329) (%)	Meat reducers (entire sample minus sub-sample) (<i>n</i> = 8,407) (%)	chi - sq.	Non-reducing omnis (sub-sample) (<i>n</i> = 934) (%)	Non-reducing omnis (entire sample minus sub-sample) (<i>n</i> = 16,242) (%)	chi - sq.
	degree to less than college degree						
	College degree or more	45.5	43.0		37.2	39.8	
Race/ Ethnicity	Hispanic	22.6	19.1		13.0	13.1	
	Black	15.9	15.9		8.7	9.7	
	(Not Hispanic)						
	Asian	5.2	6.9		4.7	4.8	
	(Not Hispanic)						
	All Other	56.4	58.1		73.7	72.4	
	(Not Hispanic)						
Household Income	\$14,999 or less	11.2	10.3		9.7	7.8	
	\$15,000 to \$24,999	8.8	8.8		8.6	8.6	
	\$25,000 to \$34,999	9.7	8.3		9.2	9.2	
	\$35,000 to \$49,999	13.1	12.3		10.2	12.7	
	\$50,000 to \$74,999	17.3	17.0		18.7	18.4	
	\$75,000 to \$99,999	10.6	12.9		14.1	13.3	
	\$100,000 or over	29.2	30.4		29.5	30.0	
		<p><i>*p</i> < 0.05 <i>**p</i> < 0.01 <i>***p</i> < 0.001</p>					

A second randomization process assigned non-reducing omnivores to one of the three study conditions: the vegetarian diet group, the reduced-meat diet group, or the

chicken-free diet group. Two discrepancies in the demographic characteristics because of this randomization were found. There was a significant association between the non-reducing omnivore samples for age by sex $\chi^2(22) = 37.934, p < 0.05$, Cramer's $V = 0.14$ (a small effect), as well as for region $\chi^2(6) = 14.986, p < 0.05$, Cramer's $V = 0.09$ (a very small effect). See Table 8.

Overall, the randomization schemes achieved a moderately balanced assignment with only three exceptions. The weighting and/or data cleaning may have played a role in the imbalances. No effort was made to adjust for the imbalances—a limitation of the study—as the focus was to ensure the larger sample itself was census-balanced.

Table 8. Demographic Characteristics of Sub-Samples for 3 Non-Reducing Omnivore Groups Devised Through Randomization from the Frozen Analytic Sample³⁵

Demographic Characteristics		Non-reducing omniv (V path) ($n = 318-319$) (%)	Non-reducing omniv (R path) ($n = 306-307$) (%)	Non-reducing omniv (C path) ($n = 302-303$) (%)	chi-sq.
Age by Sex	Female 18-24	5.7	5.6	9.2	*
	Female 25-34	11.0	11.8	8.9	
	Female 35-44	8.2	9.2	8.6	
	Female 45-54	9.1	7.8	8.3	
	Female 55-64	8.5	6.9	9.2	
	Female 65+	11.3	11.1	9.9	
	Male 18-24	8.2	4.2	4.0	
	Male 25-34	6.9	3.3	6.9	
	Male 35-44	10.4	9.2	5.6	
	Male 45-54	6.6	9.5	11.9	
	Male 55-64	6.9	8.5	10.6	
	Male 65+	7.2	13.1	6.9	

³⁵ Calculated using the cleaned weighted sample, as opposed to the smaller frozen analytic sample given that this had further data cleaning.

Demographic Characteristics		Non-reducing omnis (V path) (<i>n</i> = 318– 319) (%)	Non-reducing omnis (R path) (<i>n</i> = 306– 307) (%)	Non-reducing omnis (C path) (<i>n</i> = 302– 303) (%)	chi- sq.
Region	Northeast	23.0	14.3	19.5	*
	South	36.2	42.7	38.6	
	Midwest	24.5	18.9	20.8	
	West	16.4	24.1	21.1	
Education	Less than high school degree	12.2	6.9	9.9	
	High school degree to less than college degree	54.2	53.9	51.2	
	College degree or more	33.5	39.2	38.9	
Race/ Ethnicity	Hispanic	12.2	16.3	10.9	
	Black (Not Hispanic)	6.9	8.5	10.3	
	Asian (Not Hispanic)	3.4	5.2	5.6	
	All Other (Not Hispanic)	77.4	69.9	73.2	
Household Income	\$14,999 or less	9.1	9.8	10.2	
	\$15,000 to \$24,999	8.8	8.5	8.3	
	\$25,000 to \$34,999	8.2	8.2	10.6	
	\$35,000 to \$49,999	11.0	10.8	8.9	
	\$50,000 to \$74,999	18.5	19.9	18.2	
	\$75,000 to \$99,999	13.2	12.7	16.8	
	\$100,000 or over	31.3	30.1	27.1	

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. *V* = vegetarian diet, *R* = reduced-meat diet, *C* = chicken-free diet

4.3 Nonresponse Bias

A non-response analysis was conducted on the full dataset (30,689 respondents), which is outlined in Table 9. Respondents who completed the screener ($n = 26,535$) differed on all five demographic targets from those who did not complete the screener ($n = 4,154$). Although these differences are significant, this does not have great consequence as Nielsen continued fielding until the desired sample size was reached, i.e., until all the non-responders were replaced with responders while still working toward the census-balancing targets.

Table 9. Non-response bias analysis

Demographic Characteristics	Completed vs. Did Not Complete Screener (chi-sq.)	(Cramer's V)
Age by Sex	***	0.04 (vs)
Region	**	0.02 (vs)
Education	***	0.06 (vs)
Race/ Ethnicity	***	0.07 (vs)
Household Income	***	0.07 (vs)

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. *vs* = very small, *s* = small, *m* = medium, *l* = large

4.4 Demographics

Table 10 shows the demographic breakdown of the three diet groups and whether the differences were statistically significant. The demographic characteristics of non-reducing omnivores and the full U.S. sample are also reported. There was a significant effect of diet group on average age, $F(2, 9286) = 18.154$, $p < 0.001$, which corresponds to an effect size of $r = 0.06$, a small effect. The age range for vegetarians was smallest (18 to 81 years), with the largest spread for non-reducing omnivores (18 to 98 years). There were significant associations between the diet group and all the remaining demographic characteristics: age $\chi^2(10) = 47.983$, $p < 0.001$, Cramer's $V = 0.05$ (a very small effect); sex $\chi^2(2) = 24.691$, $p < 0.001$, Cramer's $V = 0.05$ (a very small effect); region $\chi^2(6) = 17.497$, $p < 0.01$, Cramer's $V = 0.03$ (a very small effect); education $\chi^2(6) = 20.295$, $p < 0.01$, Cramer's $V = 0.03$ (a very small effect); race/ethnicity $\chi^2(8) = 78.016$, $p < 0.001$, Cramer's $V = 0.06$ (a very small effect); and household income $\chi^2(12) = 24.354$, $p < 0.05$, Cramer's $V = 0.04$ (a very small effect).

Table 10. Demographic Characteristics, from the Weighted Cleaned Sample Leaving the Screener³⁶

Demographic Characteristics	V (<i>n</i> = 294)	R (<i>n</i> = 8,736)	C (<i>n</i> = 259)	Sig. (chi-sq. unless indicated)	Non-reducing omnis (<i>n</i> = 17,177)	U.S. pop (<i>n</i> = 26,466)	
Average age	42.2	46.4	51.2	*** (ANOVA)	47.5	47.1	
Age (range)	18–81	18–94	18–91	–	18–98	18–98	
Age (%)	18–24	18.4	12.7	13.1	***	10.1	11.1
	25–34	21.8	20.0	8.9		16.6	17.7
	35–44	16.0	15.2	13.5		17.4	16.6
	45–54	15.6	14.8	15.1		19.3	17.7
	55–64	13.9	17.1	17.8		17.4	17.3
	65+	14.3	20.1	31.7		19.3	19.6
Sex (%)	Female	63.7	50.7	58.5	***	52.8	52.3
	Male	36.3	49.3	41.5		47.2	47.7
Region (%)	Northeast	19.0	18.7	21.6	**	17.7	18.1
	South	30.8	37.5	35.9		37.3	37.3
	Midwest	26.8	18.3	15.8		23.0	21.4
	West	23.4	25.6	26.6		22.0	23.2
Education (%)	Less than 12th grade, no diploma	5.4	8.8	7.3	**	7.5	7.9
	High school diploma (or equivalent)	12.2	17.1	17.7		19.2	18.4
	Some education after high school, no degree	31.0	31.0	23.8		33.6	32.6
	College	51.4	43.1	51.2		39.7	41.1

³⁶ Note that the demographic characteristics presented here conform to the original question wording as it appears in the survey before being collapsed/reworded as it is elsewhere in the dissertation to conform to the terminology that Nielsen uses for their census-balancing targets.

Demographic Characteristics	V (<i>n</i> = 294)	R (<i>n</i> = 8,736)	C (<i>n</i> = 259)	Sig. (chi-sq. unless indicated)	Non-reducing omnis (<i>n</i> = 17,177)	U.S. pop (<i>n</i> = 26,466)	
	degree (associate, bachelor's, master's, or doctorate)						
Race/ Ethnicity (%)	Hispanic	15.6	19.2	12.3	***	13.1	15.1
	African American or Black	5.8	15.9	10.4		9.6	11.7
	Asian	16.0	6.8	6.5		4.8	5.6
	White	58.8	56.0	66.9		70.2	65.4
	Other	3.7	2.1	3.8		2.2	2.2
	race/ ethnicity (including two or more)						
Household Income (%)	\$14,999 or less	10.2	10.3	8.8	*	7.9	8.8
	\$15,000 to \$24,999	5.1	8.8	10.0		8.6	8.6
	\$25,000 to \$34,999	4.1	8.4	7.7		9.2	8.8
	\$35,000 to \$49,999	13.6	12.3	9.6		12.6	12.5
	\$50,000 to \$74,999	15.3	17.0	14.2		18.4	17.9
	\$75,000 to \$99,999	12.9	12.8	14.2		13.3	13.1
	\$100,000 or over	38.8	30.4	35.4		30.0	30.3

p* < 0.05 *p* < 0.01 ****p* < 0.001. *V* = vegetarian diet, *R* = reduced-meat diet, *C* = chicken-free diet

A visual inspection of Table 10 suggests that in comparison to meat reducers or chicken avoiders, vegetarians tend to be younger, are more likely to be female, are more

likely to live in the Midwest and less likely to live in the South, are better educated, are more likely to be Asian and less likely to be African American or Black, and are more likely to live in a household with a higher income.

4.5 Prevalence and Opinion Leaders (Current Impact)

Research Question: Which of the three diets has the highest prevalence rate among American adults and the highest number of food opinion leaders based on current eating patterns?

4.5.1 Prevalence Rates (Current Impact)

Research Question: Which of the three diets has the highest prevalence rate among American adults based on current eating patterns? A third (33.0%) of American adults self-identify as reducing their meat consumption, compared to one percent each who identify as a vegetarian (1.1%) or chicken avoider (1.0%).³⁷ See Table 11.

Table 11. Prevalence Rates

	# of Respondents (in Weighted Cleaned Sample Leaving the Screener, $n = 26,466$)	Estimated Prevalence Rate in U.S. Population (%)
Vegetarians	294	1.1
Meat reducers	8736	33.0
Chicken avoiders	259	1.0
Non-reducing omnivores	17,177	64.9
	26,466	100.0

³⁷ While it is often preferred statistical practice to include confidence intervals for prevalence estimates, this was not done in this case because MOEs were reported instead for the various iterations of the dataset.

4.5.2 Opinion Leaders (Current Impact)

Research Question: Which of the three diets has the highest number of food opinion leaders among American adults based on current eating patterns? An individual was considered an opinion leader if they had a score of four or higher (matching agree or strongly agree) on the opinion leader scale. There is a notably larger number of self-identified food opinion leaders who are meat reducers (4.6 million American adults) than vegetarians (255,000) or chicken avoiders (153,000). See Table 12.

Table 12. Opinion Leader Prevalence

	<i>n</i>	Opinion leaders (#)	Opinion leaders (%)	Number of opinion leaders among U.S. adult population (#)
Vegetarians	283	26	9.2	254,903
Meat Reducers	305	17	5.6	4,598,958
Chicken Avoiders	240	15	6.3	153,099

4.6 Prevalence and Opinion Leaders (Future Potential Impact)

Research Question: Which of the three diets is projected to have the highest prevalence rate among American adults and the highest number of food opinion leaders based on future potential eating patterns?

4.6.1 Prevalence Rates (Future Potential Impact)

Research Question: Which of the three diets is projected to have the highest prevalence rate among American adults based on future potential eating patterns? The survey question that asked non-reducing omnivores to indicate how willing, if at all, they would be to adopt one of the diets in the future—measured from 1 (*not willing*) to 5 (*willing*)—was used as the foundation for this and other projections. For simplicity sake, it was assumed that the percentage of non-reducing omnivores who will adopt one of the diets

in future may fall out as follows: not willing (0%), likely not willing (5%), unsure (25%), likely willing (50%), very willing (75%).³⁸

Notable limitations stem from these assumptions, given that it is a likely overestimate to assume that three-quarters of those who indicate they are very willing to adopt one of the diets will follow through on their intentions. Likewise, it is likely an underestimate to assume that none of those who indicate they are not willing will refrain from doing so at any point in the future. A further limitation of these calculations is that they do not factor in transitions from other diets (e.g., meat reducers who become vegetarians). Lapsing rates are also not factored into this calculation. These calculations also do not consider that the adoption rates may change as more individuals take on the diets and societal dynamics shift. The proportion of non-reducing omnivores willing to adopt the diet does not consider overlap, such that some individuals may be equally willing to adopt more than one diet. Thus, the full potential of each diet is presented to show what theoretically could be possible if advocacy efforts were put into the promotion of one diet over the others. In addition, intentions do not necessarily lead to behaviour, i.e., being willing to adopt a diet is not the same as adopting it. These calculations are a notable oversimplification and should not be used as solid projections for what the prevalence of these diets will look like in future, but rather as a simple illustration of how to assess the comparative impact given very little information and the limitations at hand.

³⁸ An alternate approach would have been to simply count “likely willing” and “very willing” as 100% each, and the other three values as 0% each. Note that “future” here is an undefinable period. It is acknowledged that a different approach to calculating willingness could lead to different results.

Using the procedure outlined above, 18.5% of non-reducing omnivores were considered to have the potential to adopt a reduced-meat diet, compared to 11.7% for a vegetarian diet and 8.9% for a chicken-free diet. See Table 13.

Table 13. Non-reducing omnivores' potential to adopt

		<i>n</i>	Willingness to adopt (#)	Potential adoption rate (%)	Potential adoption rate (#)	Potential to adopt (%)
Vegetarian path (non- reducing omnivores)	Not willing	312	123	0.0	0	11.7
	Likely not willing		102	5.0	5	
	Unsure		57	25.0	14	
	Likely willing		25	50.0	13	
	Very willing		6	75.0	5	
Meat reducer path (non- reducing omnivores)	Not willing	294	74	0.0	0	18.5
	Likely not willing		86	5.0	4	
	Unsure		76	25.0	19	
	Likely willing		50	50.0	25	
	Very willing		8	75.0	6	
Chicken avoider path (non- reducing omnivores)	Not willing	298	173	0.0	0	8.9
	Likely not willing		50	5.0	3	
	Unsure		55	25.0	14	
	Likely willing		16	50.0	8	
	Very willing		3	75.0	2	

Table 14 shows that meat reducers continue to have the highest expected prevalence rate among American adults (45.0%) when factoring in potential adoption rates among non-reducing omnivores. This in comparison to an expected prevalence rate of 8.7% for vegetarians and 6.8% for chicken avoiders.

Table 14. Future Estimated Prevalence Rates

	Current prevalence (#)	Potential adoption from non-reducing omnivores (#)	Total expected prevalence (#)	Total expected prevalence (%)
Vegetarians	2,774,520	18,899,895	21,674,415	8.7
Meat reducers	82,510,725	29,961,398	112,472,123	45.0
Chicken avoiders	2,449,576	14,425,776	16,875,352	6.8

4.6.2 Opinion Leaders (Future Potential Impact)

Research Question: Which of the three diets is projected to have the highest number of food opinion leaders among American adults based on future potential eating patterns?

The same procedures and limitations apply as before for identifying opinion leaders and those willing to adopt one of the diets under study. An added limitation is the assumption that opinion leader status will remain constant after transitioning to a new diet. A further limitation is using the proportion of opinion leaders for the non-reducing omnivore group as a whole rather than the rate among the segment of those willing to adopt the diet in question. This was done because the latter is not easily calculated because of the way willingness to transition was devised.³⁹

³⁹ An alternative would have been to assign the proportion of opinion leaders of the diet group under study. For example, for non-reducing omnivores willing to adopt a vegetarian diet the proportion of opinion leaders for vegetarians—rather than for non-reducing omnivores—would have been considered.

Table 15. Future Estimated Opinion Leaders

	<i>n</i>	Opinion leaders (#)	Opinion leaders (%)	Potential to adopt (%)	Opinion leaders among U.S. adult pop for non- reducing omnis willing to transition (#)	Opinion leaders among U.S. pop for current diet group (#)	Opinion leaders among U.S. pop factoring in current & potential future impact (#)
Vegetarian path (non- reducing omnivores)	891	75	8.4	11.7	1,590,900	254,903	1,845,803
Meat reducer path (non- reducing omnivores)	891	75	8.4	18.5	2,522,003	4,598,958	7,120,962
Chicken avoider path (non- reducing omnivores)	891	75	8.4	8.9	1,214,291	153,099	1,367,389

Table 15 shows that meat reducers have the largest number of estimated opinion leaders (7 million) when factoring in those currently in this diet group as well as those expected to transition in future. This is in comparison to 1.8 million among vegetarians and 1.4 million among chicken avoiders.

4.7 Meat-Free Meals (Current Impact)

Research Question: Which of the three diets results in the largest number of meat-free meals eaten each week and the largest number of American adults this is spread amongst based on current eating patterns?

4.7.1 Number of Meat-Free Meals (Current Impact)

Research Question: Which of the three diets results in the largest number of meat-free meals eaten by American adults each week based on current eating patterns? Table 16 shows that meat reducers currently consume the greatest quantity of meatless meals per week: 446 million meatless meals compared to 42 million for vegetarians and 25 million for chicken avoiders.

Table 16. Weekly Meatless Meals

	Meatless meals per week (mean)	Meatless meals per week among U.S. adult population (total)
Vegetarians ($n = 284$)	15.1	41,895,252
Meat Reducers ($n = 292$)	5.4	445,557,914
Chicken Avoiders ($n = 248$)	10.4	25,475,592

4.7.2 Spread of Meat-Free Meals (Current Impact)

Research Question: Which of the three diets results in the largest number of American adults eating meat-free meals each week based on current eating patterns? To determine the spread of meat-free meal participation, a threshold had to be created at which an individual was said to be partaking, given that simply eating one meat-free meal per week does not provide a sufficient distinction. The cut-off was set at the average number of meat-free meals eaten by non-reducing omnivores per week (5.12). In this way, if an individual ate more meat-free meals than those who report not restricting their meat consumption, they were said to be participating in the meatless meals phenomenon. One limitation is that if an individual does not consume many meals they did not make the cut-off. For example, although one may assume that 100% of vegetarians would be above the threshold for the average meatless meals consumed by non-reducing omnivores given that all their meals are meatless, some eat so few meals

that they do not fall into this category. Meat reducers have the largest number of individuals participating in meatless meal eating: 38 million compared to 2.3 million among vegetarians and 1.7 million among chicken avoiders. See Table 17.

Table 17. Spread of Weekly Meatless Meals

	<i>n</i>	Above average number of meatless meals for non-reducing omnivores (#)	Above average number of meatless meals for non-reducing omnivores (%)	Estimate of U.S. adults participating in meatless meals (#)
Vegetarians	284	234	82.4	2,286,048
Meat Reducers	292	134	45.9	37,864,511
Chicken Avoiders	248	171	69.0	1,689,022

4.8 Meat-Free Meals (Future Potential Impact)

Research Question: Which of the three diets is projected to result in the largest number of meat-free meals eaten each week and the largest number of American adults this is spread amongst based on future potential eating patterns?

4.8.1 Number of Meat-Free Meals (Future Potential Impact)

Research Question: Which of the three diets is projected to result in the largest number of meat-free meals eaten by American adults each week based on future potential eating patterns? Table 18 shows that meat reducers are projected to have the potential to consume the greatest quantity of meatless meals per week based on estimated future potential eating patterns: 607 million meatless meals compared to 327 million meatless meals among vegetarians and 176 million among chicken avoiders. One limitation of these calculations is the assumption that non-reducing omnivores who take on a new diet will eat the same number of meatless meals per week as those currently in the respective diet group.

Table 18. Future Projected Weekly Meatless Meals

	Current weekly meat-free meals among U.S. adults (#)	New weekly meat-free meals among U.S. adults via diet adoption by non-reducing omnivores (#)	Total future projected weekly meat-free meals among U.S. adults (#)
Vegetarians	41,895,252	285,388,417	327,283,669
Meat Reducers	445,557,914	161,791,549	607,349,463
Chicken Avoiders	25,475,592	150,028,071	175,503,663

4.8.2 Spread of Meat-Free Meals (Future Potential Impact)

Research Question: Which of the three diets is projected to result in the largest number of American adults eating meat-free meals each week based on future potential eating patterns? Meat reducers are projected to have the potential to have the largest number of individuals participating in meatless meal eating based on estimated future eating patterns: 52 million participating meat reducers compared to 18 million vegetarians and 12 million chicken avoiders. See Table 19.

Table 19. Future Projected Spread of Weekly Meatless Meals

	Current U.S. adults participating in meatless meals (#)	New U.S. adults participating in meatless meals via diet adoption by non-reducing omnivores (#)	Total future projected U.S. adults participating in meatless meals (#)
Vegetarians	2,286,048	15,572,449	17,858,497
Meat Reducers	37,864,511	13,749,409	51,613,919
Chicken Avoiders	1,689,022	9,946,805	11,635,828

4.9 Farmed Animals (Current Impact)

Research Question: Which of the three diets removes the largest number of land-based farmed animals raised for meat from the food stream based on American adults' current eating patterns?

4.9.1 Dietary Assessment

An FFQ was administered to all respondents in the screener, which is one piece of data that goes into answering this research question. See APPENDIX F – Survey Instrument for the FFQ question wording. As is common practice, during analysis the frequency scale was converted into daily servings consumed. Each instance of consumption is said to represent one serving. The midpoint was used for frequencies presented as a range (Doidge & Segal, 2012; Pollard, Steptoe, & Wardle, 1998; Salvini et al., 1989). The “2 or more times per DAY” frequency was considered to represent 2.5 times per day (Pollard et al., 1998). It is important to note that there are limitations that arise from using this type of transformation, particularly when used to derive a precise number of animals impacted from an imprecise dietary measure such as an FFQ. See Table 20 for the details of the conversion method.

Table 20. FFQ Scale Conversion

9-point frequency scale	Conversion into mean daily servings	
Never	0.000	—
1-11 times per YEAR or less frequently	0.016	6 / 365
1 time per MONTH	0.033	(1 x 12) / 365
2-3 times per MONTH	0.082	(2.5 x 12) / 365
1 time per WEEK	0.142	1 x 52 / 365
2-4 times per WEEK	0.427	3 x 52 / 365
5-6 times per WEEK	0.784	5.5 x 52 / 365
1 time per DAY	1.000	—
2 or more times per DAY	2.500	—

4.9.2 Farmed Animal Statistics

An important step in assessing which of the three diets removes the largest number of land-based farmed animals raised for meat from the American food stream is determining how many of each type of animal is killed annually in the U.S. Data for this comes from the United States Department of Agriculture and is presented in Table 21.

Table 21. Land-based Farmed Animals Killed Annually in the U.S. in 2015⁴⁰

Animal type	#
Chickens	8,822,695,000
Turkeys	232,398,000
Ducks	27,749,000
Cows	28,843,000
Calves	476,300
Pigs	115,512,200
Sheep	2,318,600
Goats	590,700
Bison	60,800

Sea animals were excluded from this analysis, which is not meant to signal that they are unworthy of consideration and it is acknowledged that limitations stem from this omission. In future, it would be beneficial to have the figures re-run to measure the impact on sea animals. Indeed, the consumption data for fish and shellfish was collected in the survey to allow for this possibility. The decision on exclusion was made for the following reasons:

1. There are concerns about the quality of the data on sea animals given that they are reported by weight rather than per individual as well as the necessity of including “feed” fish and “bycatch,” all of which requires many assumptions. There are some thorough estimates on this front however (Animal Charity Evaluators, 2014a; Sethu, 2012). Likewise, it is estimated that around 90% of the

⁴⁰ Numbers for chickens, turkeys, and ducks come from (United States Department of Agriculture, 2016c), numbers for all other animals come from (United States Department of Agriculture, 2016b) from p. 8 when available which includes slaughter on farms, otherwise from p. 15 which excludes slaughter on farms. Note that only land-based farmed animals tracked by the United States Department of Agriculture are included in this table, a limitation of which is the exclusion of other land-based animals who are used for food (e.g., rabbits).

sea animals consumed in the U.S. are imported (NOAA Fisheries, n.d.), which adds further complications to arriving at a solid figure.

2. There are concerns that including sea animal consumption will overshadow any trends in the consumption of land-based farmed animals, which is of primary interest for this research given the focus on chickens. This is made particularly salient when considering that the number of land-based farmed animals represent only 5.3% of animals killed per capita for consumption (whether direct or indirect) in the U.S., with sea animals (finfish, shellfish, feed fish, and bycatch) representing the other 94.7% (Sethu, 2012).
3. There is uncertainty about the sentience of some sea animal species (e.g., scallops, oysters, etc.). Further, many sea animals are not farmed but rather wild caught, which makes them less comparable to farmed animals on land and perhaps more comparable to hunted animals on land (deer, moose, etc.) who are also excluded from this analysis. The decision was made to avoid including only some types of sea animals based on this and other criteria.
4. The animal advocacy movement has not yet made fish a priority, while chickens are increasingly given recognition and the purpose of this study is to speak to what is already happening on the ground (whether rightly or wrongly).

4.9.3 Estimates of Farmed Animals Removed from the Food Stream

The methodology developed by Sethu (2012) has been used to estimate the number of farmed animals raised for meat who are removed from the food stream for each

American vegetarian.⁴¹ This is applied in a similar fashion for meat reducers and chicken avoiders. Table 22 provides U.S. import totals for 2015 for cows, pigs, and sheep (lambs plus mutton), which is determined by adding the imports measured by the number of animals (i.e., head) with those derived from a conversion using weight in pounds.⁴²

Table 22. Import Totals 2015⁴³

	Imports (head)	Imports (carcass weight in pounds)	Average dressed weight (pounds)	Imports (conversion from pounds to head)	Imports total
Cows	1,984,413	3,370,483,714	829	4,065,722	6,050,135
Pigs	5,741,056	1,111,347,362	213	5,217,593	10,958,649
Lambs	–	178,611,474	–	–	–
Mutton	–	34,982,957	–	–	–
Sheep	–	213,594,431	70	3,051,349	3,051,349

Table 23 outlines a similar process for 2015 exports, where the total exports entering the U.S. for cows, pigs, and sheep is determined by adding the exports measured by number of animals (i.e., head) with those derived from a conversion using weight in pounds.

⁴¹ Other types of animals killed because of meat production are not being accounted for. As Cooney explains, there are: “indirect ways that animals are killed in the meat production process. For example, we’re not including the fish and other wild animals killed when pollution from factory farms seeps into waterways. We’re also not including the wild animals who are killed by pesticide poisoning, or who are run over by farm threshing equipment, on corn and soy fields” (2014, p. 4).

⁴² Here and elsewhere, data is not always available for each of the animals assessed in this section. For example, no import data is available for chickens, turkeys, ducks, etc.

⁴³ Numbers for imports (head) and imports (carcass weight in pounds) come from (United States Department of Agriculture, n.d.). Note that cows represent beef and veal. Numbers for average dressed weight (pounds) come from (United States Department of Agriculture, 2016b). The average dressed weight is 829 pounds for cattle and 183 pounds for calves and vealers, however only the former was used as per Sethu’s (2012) methodology. Average dressed weight represents only federally inspected slaughter rather than all commercial slaughter. Given that the United States Department of Agriculture retroactively updates their estimates at times, a version of these documents downloaded on August 12, 2016 was used.

Table 23. Export Totals 2015⁴⁴

	Exports (head)	Exports (carcass weight in pounds)	Average ready-to- cook weight (pounds)** * or average dressed weight (pounds)**	Exports (conversion from pounds to head)	Exports total
Chickens		6,463,605,345	4.64	1,392,116,886	1,392,116,886
Turkeys		533,031,799	24.56	21,699,090	21,699,090
Cows	72,456	2,265,949,994	829	2,733,353	2,805,809
Pigs	40,601	4,941,440,330	213	23,199,250	23,239,851
Lambs	—	427,862	—	—	—
Mutton	—	3,961,393	—	—	—
Sheep	—	4,389,255	70	62,704	62,704

Table 24 shows the number of farmed animals slaughtered for the U.S. meat supply. The figures were derived by adding the number of animals slaughtered in the U.S. with the

⁴⁴ Numbers for exports (head) and exports (carcass weight in pounds) from (United States Department of Agriculture, n.d.). The cow exports (carcass weight in pounds) represents beef and veal. This table does not include broiler exports + other chicken exports. Numbers for average dressed weight (pounds) which were used for cows, pigs, and sheep come from (United States Department of Agriculture, 2016b). The average dressed weight is 829 pounds for cattle and 183 pounds for calves and vealers, however only the former was used per Sethu's (2012) methodology. Average dressed weight only represents federally inspected slaughter rather than all commercial slaughter. Numbers for average ready-to-cook weight (pounds) used for chickens and turkeys from (United States Department of Agriculture, 2016c). As the document notes (p. 34), "Average Live Weight: The weight of the whole bird, before slaughter. Excludes post-mortem condemnations. Certified Ready-to-Cook: The weight of poultry certified wholesome by inspection after post-mortem condemnation pounds are removed. Ready-to-cook represents poultry meat ready for the marketing channel. Dressing Percent: Usually expressed as a percentage yield of frozen and chilled carcass in relation to the weight of the live bird." Because dressed weight is not given for chickens the following procedure was followed: 1) 2015 total ready-to-cook weights (chilled and frozen): 40,570,764,000 (p. 7); 2) 2015 post-mortem condemnations: 393,051,000 (p. 11); 3) 2015 (heads) slaughtered (federally inspected only): 8,822,695,000 (p. 5); and 4) $(40,570,764,000 + 393,051,000) / 8,822,695,000 = 4.64$ pounds. For turkeys the procedure was: 1) 2015 total ready-to-cook weights (chilled and frozen): 5,627,222,000 (p. 7); 2) 2015 post-mortem condemnations: 81,567,000 (p. 11); 3) 2015 (heads) slaughtered (federally inspected only): 232,398,000 (p. 5); and 4) $(5,627,222,000 + 81,567,000) / 232,398,000 = 24.56$ pounds.

number of imports and subtracting the number of exports, for a total of 7.8 billion animals in 2015.

Table 24. Land-based Farmed Animals Slaughtered for the U.S. Meat Supply in 2015

	Land-based farmed animals slaughtered in the U.S.	U.S. imports	U.S. exports	Slaughter totals for U.S. meat supply
Chickens	8,822,695,000	—	1,392,116,886	7,430,578,114
Turkeys	232,398,000	—	21,699,090	210,698,910
Ducks	27,749,000	—	—	27,749,000
Cows	28,843,000	6,050,135	2,805,809	32,087,326
Calves	476,300	—	—	476,300
Pigs	115,512,200	10,958,649	23,239,851	103,230,998
Sheep	2,318,600	3,051,349	62,704	5,307,245
Goats	590,700	—	—	590,700
Bison	60,800	—	—	60,800
Total	9,230,643,600	20,060,133	1,439,924,340	7,810,779,394

Table 25 adds to this assessment the number of farmed animals who die before reaching slaughter. This is accomplished by adding to the number of animals slaughtered for the U.S. meat supply to the number of animals who died on the farm, in transport, etc. This raises the total figure by close to half a billion animals.

Table 25. Land-based Farmed Animals Slaughtered + Mortalities for the U.S. Meat Supply in 2015⁴⁵

	Slaughter totals for U.S. meat supply	Mortality rate (%)	Death totals for U.S. meat supply
Chickens	7,430,578,114	5.32	7,847,718,897
Turkeys	210,698,910	13.01	242,210,636
Ducks	27,749,000	0.25	27,819,404
Cows	32,087,326	4.95	33,757,477
Calves	476,300	3.50	493,575
Pigs	103,230,998	16.22	123,220,580
Sheep	5,307,245	—	5,307,245
Goats	590,700	—	590,700
Bison	60,800	—	60,800
Total	7,810,779,394	—	8,281,179,314

4.9.4 Impact of Diet on Farmed Animals

For the statistics that follow, the 2015 resident population for the United States for mid-year (July 1) was 321,418,820.⁴⁶ Table 26 shows the estimate of the number of each type of farmed animals killed annually in the U.S. per capita, ranging from 24.7 chickens to 0.1 cows, for a total of 26.1 animals per American omnivore. The figure for farmed

⁴⁵ As before, this methodology is from Sethu (2012). All mortality rates are based on the exact studies cited, except when updated versions are available: 1) Chickens – 5.32% (updated), rounded in table but full % used for calculations. 9,317,987,000 broiler-type chicks hatched in the U.S. in 2015 according to (United States Department of Agriculture, 2016a) (p. 7). 8,822,695,000 reached slaughter according to (United States Department of Agriculture, 2016c) (p. 5). This represents an estimate of a 5.32% mortality rate (outside of slaughter for meat); 2) Turkeys – 13.01% (updated), rounded in table but full % used for calculations. 267,155,000 turkey poults hatched in 2015 in the U.S. according to (United States Department of Agriculture, 2016a) (p. 37). 232,398,000 reached slaughter according to (United States Department of Agriculture, 2016c) (p. 5); 3) Ducks – 0.25% (updated). Percent of live weight of ducks condemned (ante-mortem) in the U.S. in 2015 is 0.25 according to (United States Department of Agriculture, 2016c) (p. 9), which can be calculated from 481,000 (ante-mortem condemnations live weight pounds, p.9) / 190,062,000 (total live weight, p. 5) x 100 = 0.25%; 4) Cows – 4.95% (same), rounded in table but full % used for calculations, & Calves 3.50% (same) from (United States Department of Agriculture, 2010) for which there is no more recent update; and 5) Pigs – 16.22% (same), rounded in table but full % used for calculations (Bono, Cornou, Lundbye-Christensen, & Ringgaard Kristensen, 2014).

⁴⁶ This number comes from (United States Census Bureau, n.d.-a). The 2015 population estimates are being used because the agriculture data is from 2015. Mid-year data is being used as is customary when taking the full year into account. A limitation stems from the fact that the consumption figures are for all U.S. residents, whereas the survey data is only for those 18 years or older, therefore there is an assumption of the same consumption and prevalence rates for those under 18 years as those 18 years and over.

animals killed annually per capita was derived by dividing the number of animals killed by the number of individuals in the U.S. population. The number of animals killed for omnivores follows a similar process except it discounts the number of vegetarians and vegans in the population. The mean daily servings for the U.S. omnivore population come from the FFQ data.

Table 26. Farmed Animals Killed by Meat Type Annually in the U.S. in 2015⁴⁷

Meat Type	Land-based farmed animals killed annually (total)	Land-based farmed animals killed annually (per capita)	Land-based farmed animals killed for omnivores annually (per capita)	Mean daily servings for U.S. omnivore population
Beef	34,251,052	0.1	0.1	0.37
Pork	123,220,580	0.4	0.4	0.24
Chicken	7,847,718,897	24.4	24.7	0.42
Turkey	242,210,636	0.8	0.8	0.17
Other Meats (ducks, sheep, goats, + bison)	33,778,149	0.1	0.1	0.07
Total	8,281,179,314	25.8	26.1	1.27

Table 27 shows the number of farmed animals impacted (in comparison to the average American omnivore) for each of the three diets. Of the possible 26.1 animals that could be impacted per person, vegetarians impact all 26.1, while chicken avoiders impact very close to this amount (25.3 animals). Meat reducers present an anomaly however. Rather than removing farmed animals from the food stream, these calculations suggest that meat reducers consume more land-based farmed animals than the average

⁴⁷ Land-based farmed animals killed for omnivores annually (per capita) was calculated using the prevalence rates for vegetarians from this study (1.11%), note that this does not include pescetarians. The mean daily servings for the U.S. omnivore population was calculated on the full weighted sample (labeled “Weighted Cleaned Sample”) with vegetarians excluded (i.e., $n = 26,172$).

omnivore. This discrepancy presents a notable limitation to using the FFQ data for these purposes. More about this unintuitive result is discussed in APPENDIX E – Meat Reducers Diet Discrepancy.

Table 27. Per Capita Number of Farmed Animals Impacted by Diet Type Annually in the U.S.⁴⁸

Meat Type	Vegetarians <i>n</i> = 294		Meat reducers <i>n</i> = 8,736		Chicken avoiders <i>n</i> = 259	
	Mean daily servings	Land-based farmed animals removed from the food stream (per capita)	Mean daily servings	Land-based farmed animals removed from the food stream (per capita)	Mean daily servings	Land-based farmed animals removed from the food stream (per capita)
Beef	0.00	0.1	0.36	0.0	0.22	0.0
Pork	0.00	0.4	0.25	-0.0	0.15	0.1
Chicken	0.00	24.7	0.44	-1.2	0.00	24.7
Turkey	0.00	0.8	0.22	-0.2	0.07	0.4
Other Meats (ducks, sheep, goats, + bison)	0.00	0.1	0.13	-0.1	0.06	0.0
Total	0.00	26.1	1.40	-1.5	0.50	25.3

⁴⁸ Notable limitations stem from the assumptions that went into these figures. As such, the number of animals impacted should be seen merely as a rough estimate. These figures assume that individuals' consumption prior to changing their diet is accurately represented by the average American omnivore, whereas it is possible that their consumption was lower to begin with. More appropriately this can be thought of as comparing individuals' current impact to what it would be should they eat meat like the average U.S. omnivore. The mean daily servings for each diet group were calculated on the full weighted sample (labeled "Weighted Cleaned Sample," *n* = 26,466), because this provided a much larger sample size for meat reducers. The figures were calculated as follows: the number of land-based farmed animals killed for omnivores annually per capita – (the mean daily servings for the diet in question / the mean daily servings for the U.S. omnivore population) x the number of land-based farmed animals killed for omnivores annually per capita.

Because the FFQ data is not thought to accurately represent meat reducers' daily meat consumption in relation to that of all omnivores, the meat reducer data is not used for the remaining calculations in this section, which means that this research question cannot be fully answered. While the findings for vegetarians and chicken avoiders are presented below, these should be interpreted with caution given the possibility that omnivores inaccurately reported their meat consumption, as opposed to the issue lying exclusively with the meat reducers' self-reports. Limitations stem from using very imprecise FFQ data—which is also subject to self-reported measurement errors—to determine a precise number of animals impacted. These annual figures also do not take into consideration rates of diet lapses or conversely the rates of moving to a more restricted diet.

Elasticity is considered below given that simply restricting one's meat consumption does not translate into a direct and immediate impact on farmed animals. Rather, this has an impact on supply and demand, which in turn impacts farmed animals *who are yet to be born*. Generally, it is this aspect of the far future that is of note for effective altruists. However, as Animal Charity Evaluators (2016b) explains, there are also considerations for farmed animals who are currently living:

“Most of them are brought into existence by humans so that humans can use them for food. In some cases, if the market for that food disappears, the animals will live shorter lives followed by painful deaths, as farmers seek to end their responsibilities for their livestock. In most cases, however, the market does not suddenly disappear all at once. Instead, existing animals will be sold for slightly lower prices than they otherwise would, and somewhat fewer animals will be bred to replace them. Animals who are ‘spared’ will simply not exist at all.”

Because of the degree of harm experienced by farmed animals, it is thought that not existing is likely better than being born into this industry (Animal Charity Evaluators, 2016b; Cooney, 2014, p. 7), particularly given that 99% of farmed animals in the U.S. are raised on factory farms (Farm Forward, n.d.). However, there is some debate on this matter, particularly at the individual species level (Norwood & Lusk, 2011, pp. 225–226 & 229).

In terms of elasticity, as Norwood and Lusk (2011, pp. 222-223) note: “a permanent decision to reduce meat consumption (1) does ultimately reduce the number of animals on the farm and the amount of meat produced (2), but it has less than a 1-to-1 effect on the amount of meat produced.” As Cooney (2014, p. 14) further explains:

“When demand for a product goes down, the unwanted product ends up sitting on the shelf. Producers and retailers want to sell it, but there aren’t enough customers willing to buy it. So what do retailers do? They lower the price. So when demand goes down, the price falls as well. And the lower prices in turn drive demand slightly back up.”

Animal Charity Evaluators has also taken elasticity into account (n.d.-a; 2016), though the Norwood and Lusk (2011, p. 223) figures have been used for these purposes. There were no figures offered for turkey, so it was assumed to be the same as chicken. Likewise, there were no figures for other meats, so the elasticity was assumed to be the average of the other three meats that had numbers provided.⁴⁹

Table 28 and Table 29 show that vegetarians can be said to currently remove more farmed animals annually (55 million) from the food stream than chicken avoiders

⁴⁹ The average is: $(0.68 \text{ (beef)} + 0.74 \text{ (pork)} + 0.76 \text{ (chicken)}) / 3 = 0.73$.

(47 million). Meat reducers could not be compared in this regard because of the uncertainty with the consumption data, and so this research question cannot be confidently answered with the data available.

Table 28. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Vegetarians 18+ Years⁵⁰

Meat type	Per capita	Total (not factoring in elasticity)	Elasticity	Total (factoring in elasticity)
Beef	0.1	298,977	0.68	203,305
Pork	0.4	1,075,592	0.74	795,938
Chicken	24.7	68,502,688	0.76	52,062,043
Turkey	0.8	2,114,255	0.76	1,606,834
Other Meats (ducks, sheep, goats, + bison)	0.1	294,849	0.73	215,240
Total	26.1	72,286,362		54,883,359

Table 29. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Chicken Avoiders 18+ Years

Meat type	Per capita	Total (not factoring in elasticity)	Elasticity	Total (factoring in elasticity)
Beef	0.0	107,012	0.68	72,768
Pork	0.1	356,108	0.74	263,520
Chicken	24.7	60,479,851	0.76	45,964,687
Turkey	0.4	1,098,023	0.76	834,498
Other Meats (ducks, sheep, goats, + bison)	0.0	37,188	0.73	27,147
Total	25.3	62,078,182		47,162,620

⁵⁰ The total (not factoring in elasticity) is calculated by taking the per capita number of animals impacted and multiplying it by the number of vegetarians in the U.S. adult population. The total factoring in elasticity is simply the first total multiplied by the elasticity.

Limitations include the use of self-reported diet data as well as deriving a precise number of animals impacted from an imprecise measure of food consumption such as an FFQ, particularly given the transformations that were applied. The results are meant to show estimates rather than being precise figures, and are most telling when used to compare across diets, rather than being viewed in isolation.

4.10 Farmed Animals (Future Potential Impact)

Research Question: Which of the three diets is projected to remove the largest number of land-based farmed animals raised for meat from the food stream based on American adults' future potential eating patterns? Again, because the consumption data for meat reducers has notable limitations, it was not used for these calculations and therefore the research question cannot be fully answered. Table 30 shows the expected number of farmed animals removed from the food stream annually in the U.S. by vegetarians based on future potential eating patterns.

Table 30. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Vegetarians (Future Potential Eating Patterns)

Meat type	Farmed animals removed by current vegetarians (#)	Farmed animals removed by new vegetarians via non-reducing omnivores (#)	Total projected farmed animals removed from the food stream by vegetarians (#)
Beef	203,305	1,384,900	1,588,205
Pork	795,938	5,421,890	6,217,828
Chicken	52,062,043	354,644,107	406,706,150
Turkey	1,606,834	10,945,674	12,552,508
Other Meats (ducks, sheep, goats, + bison)	215,240	1,466,204	1,681,444
Total			428,746,134

Table 31 shows the expected number of farmed animals removed from the food stream annually in the U.S. by chicken avoiders. Vegetarians are projected to remove more farmed animals annually (429 million) from the food stream in future than chicken avoiders (325 million). These figures do not factor in lapsing rates and limitations stem from assuming intentions will translate into behaviour.

Table 31. Total Number of Farmed Animals Removed from the Food Stream Annually in the U.S. for Chicken Avoiders (Future Potential Eating Patterns)

Meat type	Farmed animals removed by current chicken avoiders (#)	Farmed animals removed by new chicken avoiders via non-reducing omnivores (#)	Total projected farmed animals removed from the food stream by chicken avoiders (#)
Beef	72,848	428,537	501,304
Pork	263,810	1,551,893	1,815,413
Chicken	46,015,308	270,690,202	316,654,889
Turkey	835,417	4,914,433	5,748,930
Other Meats (ducks, sheep, goats, + bison)	27,177	159,873	187,021
Total			324,907,557

4.11 External Perceptions (Future Potential Impact)

Research Question: Which of the three diets has the best external perceptions among American adults who are not currently restricting their meat consumption?

4.11.1 Familiarity (External Perceptions)

Research Question: Which of the three diets has the best outcome on diet familiarity among American adults who are not currently restricting their meat consumption?

There was a significant effect for all pairs, with a vegetarian diet having the highest level of familiarity (indicating that respondents were most familiar with this diet): vegetarian diet > reduced-meat diet > chicken-free diet. See Table 32.

Table 32. External Perceptions – ANOVAs & Pairwise Comparisons

Variables	V		R		C		Omnibus test				Pairs
	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>df</i>	<i>F</i>	<i>p</i>	<i>r</i>	
Familiarity ‡ §	312	2.63 (1.09)	297	2.05 (0.99)	300	1.29 (0.76)	2, 592	166.480	0.000	0.50 (l)	V > R, <i>p</i> = 0.000 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.000
Social Ties ‡ §	312	1.86 (0.98)	297	1.83 (1.02)	299	1.29 (0.78)	2, 595	41.773	0.000	0.27 (s)	V = R, <i>p</i> = 0.907 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.000
Thermometer † ⊥	312	65.93 (25.38)	294	60.47 (25.80)	299	51.53 (30.07)	2, 902	21.822	0.000	0.21 (s)	V > R, <i>p</i> = 0.040 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.000
(TPB) Intentions ‡ §	312	2.00 (1.03)	294	2.43 (1.12)	298	1.75 (1.01)	2, 597	30.662	0.000	0.26 (s)	R > V, <i>p</i> = 0.000 R > C, <i>p</i> = 0.000 V > C, <i>p</i> = 0.006
(TPB) Attitudes † ⊥	312	3.01 (0.84)	294	2.91 (0.83)	297	2.56 (0.76)	2, 900	25.208	0.000	0.23 (s)	V = R, <i>p</i> = 0.376 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.000
(TPB) Perceived Behavioural Control ‡ §	312	2.55 (0.94)	294	2.94 (1.01)	297	2.90 (1.05)	2, 596	15.261	0.000	0.18 (s)	R = C, <i>p</i> = 0.870 R > V, <i>p</i> = 0.000 C > V, <i>p</i> = 0.000
(TPB) Subjective Norms ‡ §	312	2.92 (3.19)	294	4.01 (3.71)	297	3.15 (3.92)	2, 590	7.830	0.000	0.13 (s)	R > C, <i>p</i> = 0.016 R > V, <i>p</i> = 0.000 C = V, <i>p</i> = 0.721
SWFL ‡	311	2.67 (0.88)	293	2.76 (0.78)	294	2.70 (0.76)	2, 596	0.986	0.374	–	–
Convenience † ⊥	310	2.51 (1.13)	292	2.99 (1.20)	293	2.50 (1.15)	2, 892	16.844	0.000	0.19 (s)	R > V, <i>p</i> = 0.000 R > C, <i>p</i> = 0.000 V = C, <i>p</i> = 0.999
Social/persona l life † ⊥	310	3.22 (1.19)	292	3.64 (1.08)	293	3.57 (1.15)	2, 892	11.881	0.000	0.16 (s)	R = C, <i>p</i> = 0.846 R > V, <i>p</i> = 0.000 C > V, <i>p</i>

Variables	V		R		C		Omnibus test			Pairs	
	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>df</i>	<i>F</i>	<i>p</i>	<i>r</i>	
											= 0.000
Health † ⊥	310	3.50 (0.96)	292	3.42 (0.91)	293	2.65 (0.98)	2, 892	71.961	0.000	0.37 (m)	V = R, <i>p</i> = 0.716 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.000
Cost † ⊥	310	3.11 (1.07)	292	3.50 (1.03)	293	3.27 (1.15)	2, 892	9.507	0.000	0.14 (s)	R > C, <i>p</i> = 0.032 R > V, <i>p</i> = 0.000 C = V, <i>p</i> = 0.221
Motivation ‡ §	310	2.15 (1.06)	292	2.46 (1.20)	293	2.39 (1.22)	2, 588	6.756	0.001	0.12 (s)	R = C, <i>p</i> = 0.731 R > V, <i>p</i> = 0.002 C > V, <i>p</i> = 0.026
Identity † ⊥	310	2.43 (1.10)	292	2.33 (1.07)	293	2.08 (1.13)	2, 892	7.992	0.000	0.13 (s)	V = R, <i>p</i> = 0.637 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.017

Omnibus test: † One-way ANOVA, ‡ Welch's one-way ANOVA; Pairwise comparisons: ⊥ Hochberg's GT2, § Games-Howell. V = vegetarian diet, R = reduced-meat diet, C = chicken-free diet. s = small, m = medium, l = large

4.11.2 Social Ties (External Perceptions)

Research Question: Which of the three diets has the best outcome on social ties among American adults who are not currently restricting their meat consumption? There was a significant effect for two of the pairs, with a vegetarian diet and a reduced-meat diet having the highest levels of social ties (indicating that these respondents were most likely to report that they have strong and extensive ties to people who eat this way): vegetarian diet = reduced-meat diet > chicken-free diet. See Table 32.

4.11.3 Thermometer (External Perceptions)

Research Question: Which diet group has the best outcome on an attitude thermometer among American adults who are not currently restricting their meat consumption?

There was a significant effect for all pairs, with a vegetarian diet performing best on the attitude thermometer: vegetarian diet > reduced-meat diet > chicken-free diet. See Table 32.

4.11.4 Intentions (External Perceptions)

Research Question: Which of the three diets has the best outcome on intentions (TPB) among American adults who are not currently restricting their meat consumption?

There was a significant effect for all pairs, with a reduced-meat diet having the highest level of adoption intentions: reduced-meat diet > vegetarian diet > chicken-free diet. See Table 32.

4.11.5 Attitudes (External Perceptions)

Research Question: Which of the three diets has the best outcome on attitudes (TPB) among American adults who are not currently restricting their meat consumption?

There was a significant effect for two of the pairs, with a vegetarian diet and a reduced-meat diet having the highest levels of positive attitudes: vegetarian diet = reduced-meat diet > chicken-free diet. See Table 32.

4.11.6 Perceived Behavioural Control (External Perceptions)

Research Question: Which of the three diets has the best outcome on perceived behavioural control (TPB) among American adults who are not currently restricting their meat consumption? There was a significant effect for two of the pairs, with a

reduced-meat diet and a chicken-free diet having the highest perceived behavioural control (which relates to personal control, capability, and the perceived ease or difficulty respondents feel they have over eating one of the diets in the future): reduced-meat diet = chicken-free diet > vegetarian diet. See Table 32.

4.11.7 Subjective Norms (External Perceptions)

Research Question: Which of the three diets has the best outcome on subjective norms (TPB) among American adults who are not currently restricting their meat consumption? There was a significant effect for two of the pairs, with a reduced-meat diet having the highest score for subjective norms (which relates to whether the important people in respondents' life think they should eat one of the diets and to what extent they want to eat what the important people in their life think they should): reduced-meat diet > chicken-free diet = vegetarian diet. See Table 32.

4.11.8 SWFL (External Perceptions)

Research Question: Which of the three diets has the best outcome on SWFL among American adults who are not currently restricting their meat consumption? There was no effect of diet group on SWFL. The scale's individual items cover things such as being pleased with or getting satisfaction from food/meals, having food/meals be close to ideal or a positive element in one's life, and having excellent life conditions regarding food. See Table 32.

4.11.9 Convenience (External Perceptions)

Research Question: Which of the three diets has the best outcome on perceived convenience among American adults who are not currently restricting their meat

consumption? There was a significant effect for two of the pairs, with a reduced-meat diet having the highest score for perceived convenience (indicating that these respondents had the least concern that it would be inconvenient for them to eat the diet): reduced-meat diet > vegetarian diet = chicken-free diet. See Table 32.

4.11.10 Social/Personal Life (External Perceptions)

Research Question: Which of the three diets has the best outcome on social/personal life perceptions among American adults who are not currently restricting their meat consumption? There was a significant effect for two of the pairs, with a reduced-meat diet and a chicken-free diet having the highest scores on social/personal life perceptions (indicating that these respondents had the least concern that eating these diets would create issues in their social and personal life): reduced-meat diet = chicken-free diet > vegetarian diet. See Table 32.

4.11.11 Health (External Perceptions)

Research Question: Which of the three diets has the best outcome on health perceptions among American adults who are not currently restricting their meat consumption? There was a significant effect for two of the pairs, with a vegetarian diet and a reduced-meat diet having the highest scores on health perceptions (indicating that these respondents were most likely to report that these diets would be good for their health): vegetarian diet = reduced-meat diet > chicken-free diet. See Table 32.

4.11.12 Cost (External Perceptions)

Research Question: Which of the three diets has the best outcome on perceived cost among American adults who are not currently restricting their meat consumption?

There was a significant effect for two of the pairs, with a reduced-meat diet having the best cost score (indicating that these respondents had the least concern that it would cost too much to eat this way): reduced-meat diet > chicken-free diet = vegetarian diet. See Table 32.

4.11.13 Motivation (External Perceptions)

Research Question: Which of the three diets has the best outcome on motivation among American adults who are not currently restricting their meat consumption? There was a significant effect for two of the pairs, with a reduced-meat diet and a chicken-free diet having the highest scores on motivation (indicating that these respondents had the least concern that it would be difficult for them to stay motivated enough to eat this way): reduced-meat diet = chicken-free diet > vegetarian diet. See Table 32.

4.11.14 Identity (External Perceptions)

Research Question: Which of the three diets has the best outcome on identity perceptions among American adults who are not currently restricting their meat consumption? There was a significant effect for two of the pairs, with a vegetarian diet and a reduced-meat diet having the highest scores on identity perceptions (indicating that these respondents were more likely to say that they would see these diets as part of their identity): vegetarian diet = reduced-meat diet > chicken-free diet. See Table 32.

4.11.15 Perception of Prevalence Rate (External Perceptions)

Research Question: Which of the three diets has the best outcome on perceived prevalence rates (relative to the actual rate) among American adults who are not currently restricting their meat consumption? Omnivores not restricting their meat

consumption believe that vegetarianism among American adults is 23 times more prevalent than it is. They believe more than a quarter (26.0%) of U.S. adults consume the diet while the real figure is 1.1%. This was the biggest difference among the three diet groups, though the gap between the perceived and actual rate for the chicken-free diet was also notable (19 times). The estimate for a reduced-meat diet was close to the actual figure (0.9 times). See Table 33.

Table 33. Difference Between Perceived and Actual Prevalence Rates (External Perceptions)

	Mean perceived prevalence rate (%)	Actual prevalence rate (%)	Difference (magnitude)
Vegetarians ⁵¹ ($n = 312$)	26.0	1.1	23.4
Meat reducers ($n = 297$)	28.9	33.0	0.9
Chicken avoiders ($n = 299$)	18.1	1.0	18.5

4.11.16 TTM SOC (External Perceptions)

Research Question: Which of the three diets has the best outcome on the TTM SOC among American adults who are not currently restricting their meat consumption?

Descriptive statistics were not run on this variable given that it is a 1 to 3 scale. Instead, the frequencies were compared, which showed non-reducing omnivores to be further along the stages of change continuum for a reduced-meat diet, with 17.4% saying they are considering or have decided to adopt a reduced-meat diet, compared to 7.7% for a vegetarian diet and 4.0% for a chicken-free diet. A chi-square test revealed a significant association between diet group and the stages of change $\chi^2 (4) = 32.594$, $p < 0.001$, Cramer's $V = 0.13$ (a small effect). See Table 34.

⁵¹ Here and elsewhere for external perceptions, it is implied that the n refers to non-reducing omnivores who were asked about the diet in question, rather than those who currently eat the diet.

Table 34. TTM SOC

	I am not thinking about adopting a [diet type] (%)	I am considering adopting a [diet type] (%)	I have decided to but have not yet adopted a [diet type] (%)	chi- sq.
Vegetarian diet (<i>n</i> = 312)	92.3	6.1	1.6	***
Reduced-meat diet (<i>n</i> = 294)	82.7	12.6	4.8	
Chicken-free diet (<i>n</i> = 298)	96.0	2.7	1.3	

p* < 0.05 *p* < 0.01 ****p* < 0.001

4.12 Internal Experiences (Current Impact)

Research Question: Which of the three diets has the best internal experiences among American adults who are currently eating one of these meat-restricted diets?

4.12.1 SWFL (Internal Experiences)

Research Question: Which of the three diets has the best outcome on SWFL among American adults who are currently eating one of these meat-restricted diets? There was a significant effect for one of the pairs, with a vegetarian diet having the highest level of SWFL: vegetarian diet > reduced-meat diet, vegetarian diet = chicken-free diet, chicken-free = reduced-meat diet. The scale's individual items cover things such as being pleased with or getting satisfaction from food/meals, having food/meals be close to ideal or a positive element in one's life, and having excellent life conditions regarding food. See Table 35.

Table 35. Internal Experiences – ANOVAs & Pairwise Comparisons

Variables	V		R		C		Omnibus test				Pairs
	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>df</i>	<i>F</i>	<i>p</i>	<i>r</i>	
SWFL † ⊥	293	3.84 (0.69)	319	3.67 (0.61)	249	3.72 (0.71)	2, 859	5.436	0.00 5	0.11 (s)	V > R, <i>p</i> = 0.004 V = C, <i>p</i> = 0.115 C = R, <i>p</i> = 0.672
Social Ties ‡ §	284	3.50 (1.37)	312	2.62 (1.12)	246	2.33 (1.42)	2, 526	55.20 7	0.00 0	0.36 (m)	V > R, <i>p</i> = 0.000 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.029
(TPB) Intentions ‡ §	284	4.85 (0.57)	312	3.73 (0.90)	246	4.47 (1.04)	2, 503	168.3 02	0.00 0	0.49 (m)	V > C, <i>p</i> = 0.000 V > R, <i>p</i> = 0.000 C > R, <i>p</i> = 0.000
(TPB) Attitudes ‡ §	284	4.83 (0.38)	312	3.81 (0.80)	246	4.20 (0.93)	2, 463	230.9 92	0.00 0	0.51 (l)	V > C, <i>p</i> = 0.000 V > R, <i>p</i> = 0.000 C > R, <i>p</i> = 0.000
(TPB) Perceived Behavioural Control ‡ §	284	4.83 (0.38)	309	3.78 (0.86)	246	4.77 (0.64)	2, 490	191.2 60	0.00 0	0.59 (l)	V = C, <i>p</i> = 0.405 V > R, <i>p</i> = 0.000 C > R, <i>p</i> = 0.000
(TPB) Subjective Norms ‡ §	284	8.83 (7.22)	308	10.17 (7.55)	246	6.07 (6.31)	2, 554	25.51 8	0.00 0	0.23 (s)	R = V, <i>p</i> = 0.070 R > C, <i>p</i> = 0.000 V > C, <i>p</i> = 0.000
Convenience ‡ §	284	3.95 (1.14)	308	3.35 (1.25)	241	4.08 (1.20)	2, 541	28.66 5	0.00 0	0.26 (s)	C = V, <i>p</i> = 0.394 C > R, <i>p</i> = 0.000 V > R, <i>p</i> = 0.000
Social/personal life ‡ §	284	3.61 (1.17)	308	3.72 (1.09)	241	4.07 (1.05)	2, 543	12.21 8	0.00 0	0.17 (s)	C > R, <i>p</i> = 0.000 C > V, <i>p</i> = 0.000 R = V, <i>p</i> = 0.491
Health ‡ §	284	4.64 (0.61)	308	4.15 (0.84)	241	3.92 (1.10)	2, 500	59.26 1	0.00 0	0.33 (m)	V > R, <i>p</i> = 0.000 V > C, <i>p</i> = 0.000 R > C, <i>p</i> = 0.019
Cost ‡ §	284	4.06	308	3.29	241	4.23	2,	57.94	0.00	0.36	C = V, <i>p</i> =

Variables	V		R		C		Omnibus test				Pairs
	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>df</i>	<i>F</i>	<i>p</i>	<i>r</i>	
		(1.07)		(1.18)		(0.98)	550	2	0	(m)	0.135 C > R, <i>p</i> = 0.000 V > R, <i>p</i> = 0.000 V = C, <i>p</i> = 0.219 V > R, <i>p</i> = 0.000 C > R, <i>p</i> = 0.000
Motivation ‡ §	284	4.67 (0.73)	308	3.23 (1.24)	241	4.55 (0.88)	2, 531	157.6 79	0.00 0	0.56 (l)	V > C, <i>p</i> = 0.000 V > R, <i>p</i> = 0.000 C > R, <i>p</i> = 0.000
Identity ‡ §	284	4.18 (1.09)	308	2.81 (1.11)	241	3.58 (1.29)	2, 528	114.5 42	0.00 0	0.45 (l)	V > C, <i>p</i> = 0.000 V > R, <i>p</i> = 0.000 C > R, <i>p</i> = 0.000

Omnibus test: † One-way ANOVA, ‡ Welch's one-way ANOVA; Pairwise comparisons: ⊥ Hochberg's GT2, § Games-Howell. V = vegetarian diet, R = reduced-meat diet, C = chicken-free diet. *s* = small, *m* = medium, *l* = large

4.12.2 Social Ties (Internal Experiences)

Research Question: Which of the three diets has the best outcome on social ties among American adults who are currently eating one of these meat-restricted diets? There was a significant effect for all pairs, with a vegetarian diet performing best on social ties (indicating that these respondents were most likely to report that they have strong and extensive ties to people who eat the same diet): vegetarian diet > reduced-meat diet > chicken-free diet. See Table 35.

4.12.3 Intentions (Internal Experiences)

Research Question: Which of the three diets has the best outcome on intentions (TPB) among American adults who are currently eating one of these meat-restricted diets? There was a significant effect for all pairs, with a vegetarian diet having the highest level of dietary maintenance intentions: vegetarian diet > chicken-free diet > reduced-meat diet. See Table 35.

4.12.4 Attitudes (Internal Experiences)

Research Question: Which of the three diets has the best outcome on attitudes (TPB) among American adults who are currently eating one of these meat-restricted diets?

There was a significant effect for all pairs, with a vegetarian diet having the highest levels of positive attitudes: vegetarian diet > chicken-free diet > reduced-meat diet. See Table 35.

4.12.5 Perceived Behavioural Control (Internal Experiences)

Research Question: Which of the three diets has the best outcome on perceived behavioural control (TPB) among American adults who are currently eating one of these meat-restricted diets?

There was a significant effect for two of the pairs, with a vegetarian diet and a chicken-free diet having the highest perceived behavioural control (which relates to personal control, capability, and the perceived ease or difficulty respondents feel they have over continuing to follow their diet in future): vegetarian diet = chicken-free diet > reduced-meat diet. See Table 35.

4.12.6 Subjective Norms (Internal Experiences)

Research Question: Which of the three diets has the best outcome on subjective norms (TPB) among American adults who are currently eating one of these meat-restricted diets?

There was a significant effect for two of the pairs, with a reduced-meat diet and a vegetarian diet having the highest scores for subjective norms (which relates to whether the important people in respondents' life think they should eat their diet and to what extent they want to eat what the important people in their life think they should): reduced-meat diet = vegetarian diet > chicken-free diet. See Table 35.

4.12.7 Convenience (Internal Experiences)

Research Question: Which of the three diets has the best outcome on convenience among American adults who are currently eating one of these meat-restricted diets?

There was a significant effect for two of the pairs, with a chicken-free diet and a vegetarian diet having the highest scores for convenience (indicating that these respondents had the least concern that it is inconvenient for them to eat their diet): chicken-free diet = vegetarian diet > reduced-meat diet. See Table 35.

4.12.8 Social/Personal Life (Internal Experiences)

Research Question: Which of the three diets has the best outcome on the social/personal life among American adults who are currently eating one of these meat-restricted diets?

There was a significant effect for two of the pairs, with a chicken-free diet having the best score on social/personal life experiences (indicating that these respondents had the least concern that their diet creates issues in their social and personal life): chicken-free diet > reduced-meat diet = vegetarian diet. See Table 35.

4.12.9 Health (Internal Experiences)

Research Question: Which of the three diets has the best outcome on health among American adults who are currently eating one of these meat-restricted diets? There was a significant effect for all pairs, with a vegetarian diet having the best score on health experiences (indicating that these respondents were most likely to report that their diet was good for their health): vegetarian diet > reduced-meat diet > chicken-free diet. See Table 35.

4.12.10 Cost (Internal Experiences)

Research Question: Which of the three diets has the best outcome on cost among American adults who are currently eating one of these meat-restricted diets? There was a significant effect for two of the pairs, with a chicken-free diet and a vegetarian diet having the best scores for cost experiences (indicating that these respondents were the least concerned that it costs too much to eat their diet): chicken-free diet = vegetarian diet > reduced-meat diet. See Table 35.⁵²

4.12.11 Motivation (Internal Experiences)

Research Question: Which of the three diets has the best outcome on motivation among American adults who are currently eating one of these meat-restricted diets? There was a significant effect for two of the pairs, with a vegetarian diet and a chicken-free diet having the highest scores on motivation (indicating that these respondents were least likely to say it is difficult for them to stay motivated enough to eat their diet): vegetarian diet = chicken-free diet > reduced-meat diet. See Table 35.

⁵² It is worth noting that the ANOVAs did not control for confounding variables. This is particularly relevant for vegetarians' cost experiences given that, as Table 10 demonstrates, vegetarians are over-represented in the highest income group. Failing to control for the potentially confounding factor of the ability to pay in a discussion about cost experiences limits the extent to which the analysis can fully speak to this phenomenon. This limitation applies elsewhere in the dissertation as well. The decision to analyze the data without controlling for potential confounding variables was made in the interest of simplifying the analysis plan to focus solely on the diets' comparative performance for each variable under study. This was partly motivated by the fact that a bulk of the dissertation's focus was designing and implementing a large-scale and complex survey, which for feasibility reasons, necessitated a more conservative approach to the analysis. This is, however, an area that is ripe for future research.

4.12.12 Identity (Internal Experiences)

Research Question: Which of the three diets has the best outcome on identity experiences among American adults who are currently eating one of these meat-restricted diets? There was a significant effect for all pairs, with a vegetarian diet having the highest score for identity experiences (indicating that these respondents were more likely to say that they see their diet as part of their identity): vegetarian diet > chicken-free diet > reduced-meat diet. See Table 35.

4.12.13 Perception of Prevalence Rate (Internal Experiences)

Research Question: Which of the three diets has the best outcome on perceived prevalence rates (relative to the actual rate) among American adults who are currently eating one of these meat-restricted diets? Chicken avoiders believe their diet is 23 times more prevalent among American adults than it is. They believe that more than a fifth (23.3%) of U.S. adults consume the diet while the real figure is 1.0%. This was the biggest difference among the three diet groups, though the gap between the perceived and actual rate for vegetarianism (19 times) was also notable. The estimate for meat reducers was close to the actual figure (1.2 times). See Table 36.

Table 36. Difference Between Perceived and Actual Prevalence Rates (Internal Experiences)

	Mean perceived prevalence rate (%)	Actual prevalence rate (%)	Difference (magnitude)
Vegetarians ($n = 284$)	20.7	1.1	18.8
Meat reducers ($n = 312$)	40.4	33.0	1.2
Chicken avoiders ($n = 246$)	23.3	1.0	23.3

4.12.14 Length of Diet Adherence (Internal Experiences)

Research Question: Which of the three diets has the best outcome on length of diet adherence among American adults who are currently eating one of these meat-restricted diets? Chicken avoiders have the longest self-reported diet adherence (23.6 years), followed closely by vegetarians (19.5 years). Meat reducers report adhering to their diet for a notably shorter time (4.9 years). See Table 37.

Table 37. Length of Diet Adherence in Years

	Average Years (#)
Vegetarians (<i>n</i> = 275)	19.5
Meat reducers (<i>n</i> = 202)	4.9
Chicken avoiders (<i>n</i> = 221)	23.6

4.12.15 Diet Lapses (Internal Experiences)

Research Question: Which of the three diets has the best outcome on extent of diet lapses among American adults? A lapse has been operationalized as a move from a more to a less meat-restricted diet.⁵³ For these purposes, the following diet transitions were considered lapses:

- chicken avoider → non-reducing omnivore
- meat reducer → non-reducing omnivore
- vegetarian → non-reducing omnivore

⁵³ The move can be direct or indirect in that there may have been other diets adopted along the way. One limitation is that there may be an overlap between the lapsing rates, in that one individual may have previously eaten more than one of the diets, in which case they are recorded as lapsing from each equally (i.e., neither of the diets had staying power). Note that other types of diet transitions are not considered here, including those that reflect more of a move along a continuum (i.e., from less to more restrictive), such as: chicken avoider → vegetarian, and meat reducer → vegetarian. Also not considered are transitions where the change to the degree of restriction is uncertain, i.e., chicken avoider → meat reducer, and meat reducer → chicken avoider. A limitation of only considering some types of transitions is that it overlooks individuals who leave the diet even for a more restrictive one, which may speak to their satisfaction level with the diet in some ways even if the move is further along the continuum.

- vegetarian —> chicken avoider
- vegetarian —> meat reducer

Table 38. Prevalence of Lapsed Dieters

Current diet	Past diet	Proportion who ate diet in the past (%)	Full sample current diet (#)	Full sample past diet (#)
Non-reducing omnivores vegetarian path (<i>n</i> = 312)	Vegetarian diet	11.3	17,177	1,941
Chicken avoiders (<i>n</i> = 241)		50.8	259	132
Meat reducers (<i>n</i> = 306)		26.2	8,736	2,289
Non-reducing omnivores meat reducer path (<i>n</i> = 297)	Reduced-meat diet	24.9	17,177	4,277
Non-reducing omnivores chicken avoider path (<i>n</i> = 300)	Chicken-free diet	3.9	17,177	670

Table 39. Lapsing Rates

	Former (#)	Current (#)	Lapsing rate (%)
Vegetarians	4,361	294	93.7
Meat reducers	4,277	8,736	32.9
Chicken avoiders	670	259	72.1

Meat reducers have the lowest lapsing rate (32.9%), where about a third who take on the diet report later abandoning it. This is compared to lapses among close to three quarters (72.1%) of chicken avoiders and nearly all vegetarians (93.7%). See Table 38 and Table 39.

4.13 Chicken Avoiders

Because chicken avoiders represent a new area of study, it is valuable to use what information is available from this survey to better understand this population. The research showed that pescetarians comprise 0.5% of the U.S. adult population and 50.8% of chicken avoiders. Close to a half (45.4%) of chicken avoiders have some red

meat in their diet, i.e., they eat at minimum beef or pork. The remaining 3.9% of chicken avoiders follow a different dietary pattern.

The most commonly offered reasons for chicken avoidance offered in an open-ended question were ethical motivations and taste preferences, followed by health concerns. Mentioned less frequently were feelings of disgust, allergies or intolerances, and environmental concerns. Cost, social justice, and spiritual/religious reasons were mentioned by only a handful of respondents.

4.14 Concluding Summary

This chapter began by discussing the dataset's key characteristics, and the bulk of the chapter focused on the findings for the eight main indicators used in the study. The results showed that a reduced meat diet outperformed the other diets on: prevalence and opinion leaders (current impact); prevalence and opinion leaders (future potential impact); meat-free meals (current impact); meat-free meals (future potential impact); and external perceptions (addressed in terms of familiarity, social ties, an attitude thermometer, intentions, attitudes, perceived behavioural control, subjective norms, SWFL, convenience, social/personal life, health, cost, motivation, identity, perception of prevalence rate, and the TTM SOC). The vegetarian diet surpassed the others on internal experiences (addressed in terms of SWFL, social ties, intentions, attitudes, perceived behavioural control, subjective norms, convenience, social/personal life, health, cost, motivation, identity, perception of prevalence rate, length of diet adherence, and diet lapses). The reasons why the two farmed animal indicators were not able to be assessed was also explained and findings specific to chicken avoiders were also reviewed.

5.0 DISCUSSION

This chapter discusses the dissertation's findings with a consideration to how they integrate with the current literature on EAA and other topics as well as which findings were particularly unexpected. The results are summarized at the outset, after which each indicator is discussed in turn and an overarching conclusion stemming from the main research question is offered. The chapter closes with a discussion of findings specific to chicken avoiders as well as an overview of the limitations of the research.

5.1 Summary of Findings

The answers to each of the dissertation's research questions are outlined in Table 40.⁵⁴ These findings suggest there are reasons to infer that a reduced-meat diet may best support an EAA approach to dietary outreach in the U.S. Importantly, this is based only on the specific metrics used in this study. This speaks to the bigger-picture question of whether social movements should ask for smaller, intermediate steps, or whether they should focus on their desired end goal. This conclusion stems from the finding that a reduced-meat diet was the standout on five of the six indicators.⁵⁵

A reduced-meat diet had the highest prevalence rate among American adults and the highest number of food opinion leaders based on current as well as future potential

⁵⁴ The ranking procedure was established prior to data collection when the pre-analysis plan was preregistered (it was submitted to the Centre for Open Science on October 5, 2016 for their Preregistration Challenge). Having this pre-analysis plan helps minimize any bias that may have resulted from making these ranking decisions after accessing the data. Caution should be used in interpreting the conclusions (which should be seen as suggestive rather than definitive) given all the limitations at play.

⁵⁵ Limitations stem from assigning each indicator equal weight. Limitations also result from the decision to weigh each sub-indicator variable equally. This decision was made because it was thought to be too subjective to devise an alternative weighting scheme.

eating patterns. A reduced-meat diet was also found to result in the largest number of meat-free meals eaten each week and boasted the largest number of American adults this is spread amongst, both of which were based on current as well as future potential eating patterns. Of the eight topics⁵⁶ that make up these four indicators, the reduced-meat diet's dominance was driven in each case by the high proportion of current meat reducers in the population. In this way, even if another diet (typically vegetarianism) performed better, when the numbers from the population were factored in the results always favoured the reduced-meat diet. This is an important lens through which to consider the findings and their limitations. A reduced-meat diet also had the best external perceptions among American adults who are not currently restricting their meat consumption.

Lived experiences was the one exception to the meat reducers trend, with a vegetarian diet showing the best internal experiences among American adults who are currently eating one of the three meat-restricted diets. While there were no indicators on which a chicken-free diet ranked above the others, there were 10 sub-indicators where the chicken-free diet had the best outcome. Though in comparison, there were 22 sub-indicators where a reduced-meat diet had the best outcome and 18 sub-indicators where a vegetarian diet did.⁵⁷

The two farmed animal indicators were not able to be assessed as discussed in the Results Chapter as well as APPENDIX E – Meat Reducers Diet Discrepancy.

⁵⁶ These are: 1) prevalence rates (current impact); 2) opinion leaders (current impact); 3) prevalence rates (future potential impact); 4) opinion leaders (future potential impact); 5) number of meat-free meals (current impact); 6) spread of meat-free meals (current impact); 7) number of meat-free meals (future potential impact); and 8) spread of meat-free meals (future potential impact).

⁵⁷ Note that more than one diet can have the best outcome on a sub-indicator.

Importantly, even if these indicators were measurable and one of the diets other than meat reduction ranked highest, this would not have changed the dissertation's overarching conclusion.

Table 40. Diets' Ranking on Indicators

Indicator	Sub-indicator	Standout diet	Overall standout diet
1. Prevalence and Opinion Leaders (Current Impact)	1.a Prevalence Rates (Current Impact)	R	R
	1.b Opinion Leaders (Current Impact)	R	
2. Prevalence and Opinion Leaders (Future Potential Impact)	2.a Prevalence Rates (Future Potential Impact)	R	R
	2.b Opinion Leaders (Future Potential Impact)	R	
3. Meat-Free Meals (Current Impact)	3.a Number of Meat-Free Meals (Current Impact)	R	R
	3.b Spread of Meat-Free Meals (Current Impact)	R	
4. Meat-Free Meals (Future Potential Impact)	4.a Number of Meat-Free Meals (Future Potential Impact)	R	R
	4.b Spread of Meat-Free Meals (Future Potential Impact)	R	
5. Farmed Animals (Current Impact)	5.a Farmed Animals (Current Impact)	N/A	N/A
6. Farmed Animals (Future Potential Impact)	6.a Farmed Animals (Future Potential Impact)	N/A	N/A
7. External Perceptions (Future Potential Impact)	7.a Familiarity	V	R
	7.b Social Ties	V, R	
	7.c Thermometer	V	
	7.d Intentions	R	
	7.e Attitudes	V, R	
	7.f Perceived Behavioural Control	R, C	
	7.g Subjective Norms	R	
	7.h SWFL	—	
	7.i Convenience	R	
	7.j Social/Personal Life	R, C	
	7.k Health	V, R	
	7.l Cost	R	
	7.m Motivation	R, C	

Indicator	Sub-indicator	Standout diet	Overall standout diet
	7.n Identity	V, R	
	7.o Perception of Prevalence Rate	V	
	7.p TTM SOC	R	
8. Internal Experiences (Current Impact)	8.a SWFL	V	V
	8.b Social Ties	V	
	8.c Intentions	V	
	8.d Attitudes	V	
	8.e Perceived Behavioural Control	V, C	
	8.f Subjective Norms	R, V	
	8.g Convenience	C, V	
	8.h Social/Personal Life	C	
	8.i Health	V	
	8.j Cost	C, V	
	8.k Motivation	V, C	
	8.l Identity	V	
	8.m Perception of Prevalence Rate	C	
	8.n Length of Diet Adherence	C	
	8.o Diet Lapses	R	

V = vegetarian diet, R = reduced-meat diet, C = chicken-free diet

5.2 Prevalence and Opinion Leaders (Current Impact)

5.2.1 Prevalence Rates (Current Impact)

Meat reducers dramatically overshadow vegetarians and chicken avoiders in the U.S. population. This gives meat reducers an advantage in terms of modeling consumption norms and increasing demand for meat-free fare. The fact that a third of American adults self-identify as meat reducers suggests that this may be a powerful group for advocates to harness in terms of their desire to shift customs around food. This speaks to the potential benefits of initiatives that look beyond an “all-or-nothing” approach as the Reducetarian Foundation does, with its efforts to encourage individuals to eat fewer animal products irrespective of the degree of reduction or their motivation

for doing so (The Reducetarian Foundation, n.d.). Though close to two-thirds of American adults are not restricting their meat consumption in any of the ways tested, which despite the notable prevalence of meat reducers, highlights that the overwhelming majority of Americans are not sufficiently interested in meat restriction to have already made adaptations to their diet.

From a social movement outcomes perspective, cultural outcomes may be of relevance here. Cultural outcomes are thought of as: “changes in the values and ideas of the public, the development of new cultural products and practices (for example, popular culture and language), and the formation of collective identity and subcultures” (Bosi & Uba, 2009, pp. 409–410). Thus, perhaps the larger the subpopulation, the more movement there may be on cultural outcomes. However, in many ways vegetarianism, despite its much smaller prevalence, is more rooted in mainstream consciousness⁵⁸ than meat reduction and so it may not be enough to examine prevalences in isolation without considering how public values and ideas are changing and how collective identities and subcultures are forming in response.

The proportion of meat reducers in the U.S. adult population (33%) identified in this study is larger than the proportion cited in a previous study: 26% (Faunalytics, 2007). There are, however, important differences in the methods used and the current rate should be viewed with some caution given discrepancy with meat reducers’ dietary data. The Faunalytics data was collected in 2005, more than a decade before the current

⁵⁸ Greenebaum has written about a similar pattern for veganism, noting that “although only 1 million people (0.5 percent) in the United States follow a vegan diet, veganism has become more prominent in US culture, particularly in its dietary and culinary aspects” (2012b, p. 130).

study, which allows time for meat consumption trends to have changed. Interestingly, a more recent study also puts the proportion of Americans who say they have been eating less meat at 26% (Sentenac, 2015b), though the methods of that study are not readily accessible. This is a far larger percentage than found in a University of Arizona MBA marketing research report. In that study, 11% of Americans indicated: “I am partially a vegetarian. I limit the amount or kinds of meat I eat” (Ball, 2015b, p. 10). However, the smaller proportion could be due to the reference to semi-vegetarianism in the question wording.

Even though the proportion of chicken avoiders was smaller than hypothesized (1.0% vs. 5%), it is still notable that these individuals represent roughly the same proportion as vegetarians (1.1%). This is noteworthy particularly because far less is discussed in mainstream culture about chicken avoiders or even pescetarians who make up a notable proportion of chicken avoiders.

The initial assumption was that chicken avoiders would account for approximately 5% of the population based on findings from Asher et al., (2014b, p. 8). There is reason to believe the estimate in the present study is more accurate for several reasons. First, the current research included a verification check on chicken avoiders. In this case 71 of the 371 individuals (19.1%) routed to this path based on their FFQ answers did not confirm that they were excluding chicken from their diet. Second, the diet question was asked in such a way that it was harder to misinterpret: “How often do you usually consume the following foods? Answer based on your current diet.” The inclusion of “current diet” was used to limit any confusion that the question may be asking about another period (e.g., that day, that week). The Asher et al., (2014b) study phrased the question as: “Which foods/beverages do you currently consume? Check any

that apply” (Faunalytics, 2016), which could be more open to individual interpretation. Likewise, the inclusion of a frequency scale in the current study may have helped reinforce what the question was asking, whereas the Asher et al., (2014b) study used a check all that apply design.

The proportion of vegetarians was also lower than expected: 1.1% for the current research compared to 1.9% in the Asher et al., (2014b) study. The possibility exists that the proportion of vegetarians dropped slightly between May 2014 when the Asher et al., (2014b) study was conducted and October 2016 when the data was collected for this study. This is unlikely with what appears to be the increasing popularity of meat-free diets (Google Trends, 2017). Further, vegetarians are younger than their omnivore counterpart who are not restricting their meat consumption and so the slightly younger sample for the Asher et al., (2014b) study of 17+ years (vs. 18+ years for the current study) could be a contributing factor. However, more likely, the reasons mentioned above concerning how the diet questions were asked could be driving the differences here as well. A further and very likely potential explanation is the inclusion of weighting for this study unlike for the Asher et al., (2014b) study. Finally, the sample for the current study was also more than twice as large (26,466 vs. 11,399), which may have increased its accuracy.

This study’s prevalence rate for vegetarians differed from another common source for this information, The Vegetarian Resource Group (n.d.), which in 2016 found that 3.3% of the U.S. adult population was vegetarian or vegan. This figure is three times as high as in the current study. The Vegetarian Resource Group settled on their rate by asking individuals to choose the statement that best describes their eating behaviour, which included options for “I never eat meat, fish, seafood, poultry, dairy, or eggs” and

“I never eat meat, fish, seafood, or poultry,” which is a different approach than that taken in this study.

While the sample from which The Vegetarian Resource Group data was drawn (2,015 individuals) is far smaller than the current study's, the methodology is comparable in many other ways including that both used a Nielsen sample (in The Vegetarian Resource Group case, Nielsen's Harris Poll), both sourced the data during 2016, both surveyed those 18+ years of age, and both employed weighting. The principal difference was the question wording and it remains unclear whether this study's FFQ or The Vegetarian Resource Group's approach is better able to estimate the proportion of vegetarians in a population. However, given this study's far larger sample size, the detail required for responding to an FFQ, and the propensity of individuals to over-report adherence to vegetarianism, it is possible that the current study provides the more accurate estimate. It should be noted that the current research also required self-identification with the vegetarian or vegan label, which may be a cause for deviation in the numbers. For example, 60 of the 391 individuals (or 15% on the unweighted sample) who indicated on the FFQ that they ate a meat-free diet were removed for failing to self-identify as vegetarian or vegan in a separate question.⁵⁹

⁵⁹ It is worth noting that the removal of these participants could bias this sample by limiting it to those who align their identity with the vegetarian label. This is especially salient given the role that identity is thought to play in dietary behaviour (as discussed elsewhere). This exclusion was necessary, however, for logistical reasons to limit respondent burden in instances where participants would be asked about a vegetarian or vegan diet for the remainder of the survey without identifying as such and thus leading to respondent frustration, drop-offs, and/or poor quality responses.

5.2.2 *Opinion Leaders (Current Impact)*

The purpose of the food opinion leader question was to determine if one diet has the potential for more down-stream/far future effects than the others in terms of creating more societal-level change. The far future is a topic prioritized by effective altruists (Muehlhauser, 2015, p. 103). However, making projections about the far future in general, and social movement success in particular, is a difficult endeavour given Giugni's assertion that social movement's goals "may expand in response to initial successes, or contract in the face of failures" (1998, p. 411) and given that "efforts that are quite unsuccessful in the short run may have big effects in the long [term]" (1998, p. 412). Likewise, Bosi & Uba have explained that "social change may move with, or against, the movement objectives, and effect the movement in unexpected way" (2009, p. 410).

There are limitations to assuming that a single approach can measure the opinion leader phenomenon, especially given that there are many factors potentially affecting the dynamics of how individuals self-identify in this way. For example, work by Xie et al., (2011, p. 111301) suggests that "the prevailing majority opinion in a population can be rapidly reversed by a small fraction [...] of randomly distributed committed agents who consistently proselytize the opposing opinion and are immune to influence." Their modelling indicates that when this dedicated group expands beyond the critical threshold of 10% of the population, there is a notable decrease in the time needed for the rest of the population to embrace the opinion (Xie et al., 2011, p. 111301). This dissertation, however, does not sufficiently examine whether opinion leaders "consistently proselytize" their food-based opinions nor whether they are "immune to influence" in

this regard. It also does not examine current or projected future instances where the critical 10% threshold may be surpassed.

While there is a notably larger number of self-identified food opinion leaders who are meat reducers than vegetarians or chicken avoiders, the explanation for this lies with the fact that there are many more meat reducers in America generally. Indeed, the proportion of opinion leaders is smaller among meat reducers (5.6%) than it is in for other two diet groups: 9.2% for vegetarians and 6.3% for chicken avoiders.

It is not surprising that vegetarians had the highest proportion of opinion leaders considering they stereotypically are perceived as being more vocal about their diet than the other two groups. Likewise, vegetarians' diet choices are presumably more apparent to those around them and they are also potentially more likely to take on advocacy roles. Research has shown that “vegetarians disregard to some extent social influence over them and, quite the opposite, they are a force of change and opinion-leaders in their social circles” (Ball, 2015b, p. 5). Yet, if vegetarians are not enjoying their diet or if their diet seems to outsiders to be too much of a burden, then the influence may not be a positive one, which is one way in which having a greater proportion of food opinion leaders could backfire and thus illuminates one reason why this indicator should be interpreted with caution.

5.3 Prevalence and Opinion Leaders (Future Potential Impact)

5.3.1 Prevalence Rates (Future Potential Impact)

The reduced-meat diet was estimated to enjoy the highest willingness to adopt (18.5%), compared to the vegetarian (11.7%) or chicken-free diets (8.9%). Interestingly, the

projected increase in expected prevalence rates for vegetarians (1.1% to 8.7% of American adults) is eight times higher. Likewise, the increase for chicken avoiders (from 1.0% to 6.8%) is seven times as high, both of which are proportionately larger than the expected change for meat reducers: 33.0% to 45.0% of adult Americans or 1.4 times as many. Thus, once again, it is the high rate of current meat reducers that is driving its high expected prevalence rate in future.

It is noteworthy that the proportion of non-reducing omnivores who are willing to adopt a reduced-meat diet versus the other two diets was not larger given the notable difference in the current prevalence rates. With 30 times as many meat reducers as vegetarians, it would not have been unreasonable to expect that the proportion of non-reducing omnivores willing to adopt a reduced-meat diet would be much more than 1.6 times larger compared to the proportion willing to adopt a vegetarian diet.

5.3.2 Opinion Leaders (Future Potential Impact)

As before, the driving force behind the considerably higher projections for future opinion leaders among meat reducers is the sizeable proportion of current reducers among the U.S. adult population. While the number of food opinion leaders among meat reducers is projected to jump from 4.6 million to 7.1 million (a 1.5-fold increase) the jump for vegetarians is expected to be a seven-fold increase (255,000 to 1.8 million). Interestingly, a larger proportion (8.4%) of non-reducing omnivores are food opinion leaders than chicken avoiders (6.3%) or meat reducers (5.6%)—they are surpassed only by vegetarians (9.2%) in this regard.

5.4 Meat-Free Meals (Current Impact)

5.4.1 Number of Meat-Free Meals (Current Impact)

Meatless consumption (rather than solely individuals) is an important metric given that it may drive demand for meatless fare far faster than a small group of meat-free individuals could, which puts greater pressure on food suppliers to respond to this changing market and in turn lowers barriers to meat-free eating more generally (Leenaert, 2016). One limitation of the question wording is that it does not allow for other ways that meat may be consumed such as through snacks, which downplays the role that these foods may have in shifting demand and food norms.

Vegetarians currently consume more meatless meals per week (15.1 meat-free meals) than chicken avoiders (10.4 meat-free meals) or meat reducers (5.4 meat-free meals). However, given the large number of meat reducers among U.S. adults, it is this group who overwhelmingly consume the greatest quantity of meatless meals weekly. Reducers consume 446 million meat-free meals on a weekly basis compared to a tenth that amount for vegetarians (42 million) and even fewer for chicken avoiders (25 million).

It is noteworthy that the number of meals consumed per week by vegetarians (15.1), by chicken avoiders (10.4), and by meat reducers (5.4) is notably lower than 21 (see Table 45 in the appendix), a figure traditionally associated with the expected seven breakfasts, seven lunches, and seven dinners per week. These figures are lower, though not demonstrably so, than other estimates of weekly meal consumption in the U.S., including an average of 17.3 meals per week among adult grocery shoppers in the U.S. (Food Marketing Institute, 2015, p. 10). Nevertheless, a potentially more fitting way to

look at the difference in meat-free eating is to examine the proportion of meatless meals as a total of all meals. Using this approach, the trend still holds: 100% for vegetarians, 66% for chicken avoiders, and 36% for meat reducers (also from Table 45).

5.4.2 Spread of Meat-Free Meals (Current Impact)

The “spread-factor” has been said to be an important metric per the rationale that having meatless eating spread among more people will help increase its societal impact from both suppliers and consumers than the same amount of demand would had it been concentrated in fewer people (Leenaert, 2016). The vegetarian group had the highest proportion of individuals participating in meatless meal eating: 82% compared to 69% of chicken avoiders and 46% of meat reducers. Given the considerable number of meat reducers among U.S. adults however, meat reducers encompassed the largest number of individuals who are participating: 38 million compared to 2.3 million vegetarians and 1.7 million chicken avoiders. Thus, as before, the high proportion of current meat reducers is driving the trend.

5.5 Meat-Free Meals (Future Potential Impact)

5.5.1 Number of Meat-Free Meals (Future Potential Impact)

As before, the high proportion of current meat reducers is driving the finding of a higher percentage of future projected weekly meatless meals among meat reducers (607 million) than among the other two diet groups: 327 million for vegetarians and 176 million for chicken avoiders. Interestingly however, it is vegetarians who are projected to add the most meatless meals in future: 285 million compared to 162 million for meat reducers and 150 million for chicken avoiders. While the number of meatless meals

coming from vegetarians is projected to increase eight-fold, the increase for meat reducers is only expected to climb by a factor of 1.4. Despite this promising trend for vegetarianism, when these anticipated changes are viewed in conjunction with current trends, the potential impact of a reduced-meat diet is greater in comparison.

5.5.2 Spread of Meat-Free Meals (Future Potential Impact)

It is vegetarians who are projected to add the largest number of individuals participating in meatless meal eating in future: 16 million compared to 14 million for meat reducers and 10 million for chicken avoiders. While the number of participating vegetarians is projected to increase eight-fold, the increase for meat reducers is only expected to be 1.4 times the current amount. However, the high prevalence of current meat reducers is once more driving the finding of a larger future projected number of individuals participating in meatless meal eating among meat reducers (52 million) than among the other two diet groups: 18 million vegetarians and 12 million chicken avoiders.

5.6 Farmed Animals (Current Impact & Future Potential Impact)

While these research questions could not be confidently answered with the data at hand, it is worth mentioning that vegetarians are said to remove a larger number of land-based farmed animals raised for meat (55 million) from the food stream compared to chicken avoiders (47 million) based on American adults' current eating patterns. This is also the case for future potential eating patterns: 429 million for vegetarians and 325 million for chicken avoiders. This is to be expected given the slightly higher proportion of vegetarians in the U.S. adult population as well as the greater restrictions they place on their diet.

5.7 External Perceptions (Future Potential Impact)

The finding that a reduced-meat diet had the best external perceptions among American adults who are not currently restricting their meat consumption makes intuitive sense given the viewpoint that meat consumption is the dominant conventional social practice within North American society and that meat reduction is presumably a less limiting diet than vegetarianism and a more well-known (or at least easily understood) diet than chicken avoidance. Research has also shown that chicken is considered a more challenging food to remove from one's diet than beef or pork (Humane League Labs, 2014, p. 32), which may also speak to the lower impressions non-reducing omnivores had about the chicken-free diet.

External perceptions are noteworthy given work on frame alignment processes in the social movement outcomes literature. Frame alignment occurs when “organizers seek to join the cognitive orientations of individuals with those of social movement organizations,” the success of which is said to be partly determined by “the *cultural resonance* of the frames advanced by organizers” (McAdam, 1994, p. 37). In this way, the diet with the best external perceptions (i.e., promise for uptake) may be a superior focus for frame alignment work and in turn have a better likelihood of meeting social movement objectives in this regard.

5.7.1 Familiarity (*External Perceptions*)

It comes as no surprise that respondents were most familiar with a vegetarian diet given the extent to which it continues to permeate the mainstream consciousness, however this does go notably against the trends in prevalence rates as discussed above. It will be

interesting to see whether initiatives like Meatless Mondays and the Reducetarian Foundation help shift this familiarity metric in the favour of a reduced-meat diet.

5.7.2 Social Ties (External Perceptions)

The topic of social ties addresses to what extent respondents have strong and extensive ties to people who eat the diet in question. Respondents report an equal level of social ties with vegetarians and meat reducers, yet, as we saw above, cite vegetarianism as the more familiar diet. One potential explanation could be that while participants know an equal number of individuals in each diet group, they are more familiar with what a vegetarian diet specifically entails.

5.7.3 Thermometer (External Perceptions)

The fact that vegetarians had the most favourable rating on the attitude thermometer is a noteworthy finding given the level of documented stigma towards vegetarians. MacInnis & Hodson have, for example, found negative assessments of vegetarians and vegans to be common. Their research showed that omnivores assigned more negative ratings to vegetarians and vegans than common targets of prejudice (e.g., African Americans) and more negative ratings than many nutritional outgroups (e.g., those who are gluten intolerant) (MacInnis & Hodson, 2015, p. 1). They also showed that vegetarians and vegans themselves report facing negativity in response to their diet (MacInnis & Hodson, 2015, p. 1).

Twine (2014, p. 623) has noted that vegans have been conceptualized as “killjoys” given their “transgression of normative scripts of happiness and commensality in a dominant meat and dairy consuming culture.” Likewise, Cole and Morgan (2011, p.

134) have examined discourses around veganism in national newspapers in the UK and found that newspapers were inclined to “discredit veganism through ridicule, or as being difficult or impossible to maintain in practice.” Cole and Morgan also found that vegans were “stereotyped as ascetics, faddists, sentimentalists, or in some cases, hostile extremists” (2011, p. 134), all of which they classify as vegaphobia. Greenebaum has noted that vegans “often feel silenced by stereotypes, misinformation, and conflict” by omnivores in daily interactions (2012a, p. 309). Other research has found attitudes towards vegetarians to be mostly positive in contrast, though this could have been an artifact of sampling given that the study was conducted with a mostly-female university sample (Chin et al., 2002, p. 332).

Another reason why it is perhaps unexpected that the vegetarian diet performed the best on this metric is that research into the attitudes and intentions of omnivores, pescetarians, vegetarians, and vegans has shown that “respondents displayed most positive attitudes and beliefs towards their own diets, and most negative attitudes and beliefs towards the diet most different from their own” (Povey et al., 2001, p. 17). In this regard, it would be a safe assumption that non-reducing omnivores would rate the vegetarian diet most negatively given that it deviates the most from their diet. Regardless of which diet had the most favourable rating however, it is worth noting that the mean scores out of 100 given to the diets by non-reducing omnivores were not especially favourable in either case: vegetarians (65.93), meat reducers (60.47), and chicken avoiders (51.53).

It is unsurprising that chicken avoiders received the lowest rating given that this diet is the least well known of the three. In terms of vegetarians outperforming meat reducers, the survey data is not able to speak to why this was the case, though it is

possible that attitudes are beginning to change towards meat-free diets and, importantly, the differences were not large. A further possibility is that answering this question in the context of this specific survey and the definitions used created measurement differences. Additionally, because most of the existing literature speaks to perceptions of vegetarians and vegans in isolation rather than in conjunction with perceptions of other meat restricted diets, there is no well-developed body of literature from which to be able to fully understand comparative trends in this regard, which is something this study helps address.

5.7.4 Intentions (External Perceptions)

A reduced-meat diet had the highest adoption intentions among non-restrictors. The findings are in line with a study by Faunalytics (2007, p. 9) that found that the proportion of American adults who were willing to cut their meat consumption by half (24%) was three times larger than those willing to adopt a vegetarian diet (7%).

A further study showed a reduced meat diet is more appealing to American omnivores than a vegetarian diet, but with a narrower margin: 19% indicated “I have never been a vegetarian, [b]ut I might cut back on meat consumption,” compared to 14% who affirmed “I have never been a vegetarian, [b]ut I am open to the idea” (Ball, 2015b, p. 10). The options appear to have been mutually exclusive, which may explain the lower numbers. Although the study did not specifically inquire about willingness to consider a chicken-free diet, participants were asked whether they had contemplated reducing their intake of certain meats, with 19% indicating yes for chicken. As discussed, research has shown that individuals are likely to exhibit the most adverse reactions to diets that differ the most from their own (Povey et al., 2001, p. 17), which

may explain why the reduced-meat diet had better adoption intentions than the vegetarian diet.

5.7.5 *Attitudes (External Perceptions)*

One key aspect of the sociology of food is understanding the role of habit in food decision-making. Attitudes are central to this given that, as Singer notes, “behind the mere momentary desire to eat meat on a particular occasion lie many years of habitual meat-eating which have conditioned our attitudes” (1990, p. v). The attitudes measure used in this study related to respondents’ overall feelings towards the diet in question on four five-point scales ranging from: bad to good, harmful to beneficial, unpleasant to pleasant, and unenjoyable to enjoyable. Non-reducing omnivores reported equally positive attitudes toward the vegetarian and reduced-meat diets. This is an interesting finding given that, as we have seen, individuals are inclined to hold the most positive attitudes towards diets that differ the least from their own (Povey et al., 2001, p. 17).

5.7.6 *Perceived Behavioural Control (External Perceptions)*

Both a reduced-meat diet and a chicken-free diet were found to have the highest levels of perceived behavioural control, which relates to personal control, capability, and the perceived ease or difficulty respondents feel they have over eating one of the diets in the future. Unsurprisingly, both diets had higher values than the vegetarian diet, which is the most restrictive of the three and so it is easy to imagine that non-reducing omnivores may feel less personal control, less capable, and/or perceive greater difficulty in following a vegetarian diet in the future. Research has shown that individuals report the lowest scores for perceived behavioural control for diets that differ the most from their

own (Povey et al., 2001, p. 22), so vegetarianism's poorer performance here is not unexpected.

5.7.7 Subjective Norms (External Perceptions)

Food habits are social constructions (Germov & Williams, 2008, p. 4) and because they are subjective creations it becomes increasingly important to understand the sociological forces that impact diet such as subjective norms around food. A reduced-meat diet had the best outcome on subjective norms, which relates to whether the important people in respondents' life think they should eat one of the diets and to what extent they want to eat what the important people in their life think they should. Other research has also shown that individuals report the lowest levels of social pressure for diets that differ the most from their own (Povey et al., 2001, p. 22). A potential explanation for the findings is that a reduced-meat diet is less restrictive than a vegetarian diet and more common than a chicken-free diet so may be more apt to be identified by respondents as one that the important people in their life think they should eat.

5.7.8 SWFL (External Perceptions)

There was no effect of diet group on SWFL. The scale's individual items cover things such as being pleased with or getting satisfaction from food/meals, having food/meals be close to ideal or a positive element in one's life, and having excellent life conditions regarding food. The finding is especially unforeseen because other research has shown a reduced-meat diet (referred to as a plant-based diet by the authors) to be differentiated from a vegetarian diet in terms of the taste aspect of food satisfaction. Lea, Crawford, and Worsley report that "the primary barrier to eating a vegetarian diet related to taste,

whereas taste barriers ranked relatively low in the plant-based diet survey. Presumably this is due to meat not necessarily being excluded from a plant-based diet, whereas it is from a vegetarian diet” (2006b, p. 835).

Other work has suggested that food satisfaction plays an important role in diet choice. The three Ns of justification—meat is normal, natural, and necessary—are based on the theorizing of Joy (2010). Work by Piazza et al., (2015) added a fourth N (nice), with empirical work supporting the conclusion that there is a food satisfaction component to meat consumption. The taste of meat has also been shown to be a barrier to the adoption of both meat reduction (Faunalytics, 2007, p. 7) and vegetarianism (Cooney, 2014, p. 82; Humane League Labs, 2014, p. 14). It is possible to hypothesize that this barrier would be stronger for the vegetarian diet, so the fact that the three diets did not differ on perceived food life satisfaction is surprising given the degree to which they differ on the level of meat consumed.

5.7.9 Convenience (*External Perceptions*)

The reduced-meat diet had the highest score for perceived convenience, indicating that these respondents had the least concern that it would be inconvenient for them to eat the diet. Although there is no supporting data on whether or not convenience serves as a barrier to the adoption of a chicken-free diet, there is literature suggesting that lack of convenience hinders both the adoption (Cooney, 2014, p. 82; Humane League Labs, 2014, p. 13) and the maintenance of vegetarianism (Asher et al., 2015, p. 6). Lea et al., (2006b, p. 831) have also shown a lack of options while eating out to be a barrier to the adoption of a reduced-meat diet. A Faunalytics (2007, p. 6) study also found lack of

convenience to be a barrier to both the adoption of a reduced-meat diet and a vegetarian diet.

5.7.10 Social/Personal Life (External Perceptions)

The potential for social and personal conflicts is of relevance given that in addition to meeting the requirements of the body, the consumption of food is used to satisfy a host of socially determined needs. Indeed, it has been asserted that “when humans eat, they eat with the mind as much as with the mouth” (Beardsworth & Keil, 1997, p. 52). Given that eating is not only an individual endeavour but a social activity (Paisley et al., 2008, p. 80), it is understandable that social influences impact the outcome of attempts at dietary change (Haverstock & Forgays, 2012, p. 1030).

A reduced-meat diet and a chicken-free diet had the highest score on social/personal life perceptions, indicating that these respondents had the least concern that eating these diets would create issues in their social and personal life. Although there is no supporting data on whether or not social and personal concerns serve as a barrier to the adoption of a chicken-free diet, there is literature suggesting that issues of diet in one’s social and personal life are a hindrance to both the adoption (Cooney, 2014, p. 82; Humane League Labs, 2014, p. 13; Lea et al., 2006b, p. 831) and maintenance of vegetarianism (Asher et al., 2015, p. 5). A Faunalytics (2007, p. 7) study also found opposition from social and cultural influences to be a barrier to the adoption of a reduced-meat diet.

Family members have been shown to serve a pivotal role in the success of dietary modifications (Paisley et al., 2008, p. 80). Research has highlighted that families may be opposed to another family member’s adoption of a meat-free diet (Beardsworth

& Keil, 1997, p. 235; Hirschler, 2011, p. 162; Jabs, Devine, & Sobal, 1998, p. 186; Jabs, Sobal, & Devine, 2000, pp. 383 & 389; McDonald, 2000, p. 12; Roth, 2005, pp. 183, 187–188, 194 & 197). Food also plays a role in romantic relationships, given that if one partner attempts to change their diet, the other can have a notable impact on the process, including for vegetarianism (Paisley et al., 2008, pp. 80, 83–84).

5.7.11 Health (External Perceptions)

Both a reduced-meat and a vegetarian diet had the highest score on the question that asked respondents whether the diet would be good for their health. The fact that these diets share this position is surprising given that research has found the view that humans are supposed to eat meat is a bigger obstacle to eating a vegetarian diet than it is for a reduced-meat diet (Lea et al., 2006b, p. 835). Further, in comparison to a vegetarian diet, a reduced-meat diet has less pronounced perceptions of health concerns and greater perceptions of health benefits (Lea et al., 2006b, p. 835).

Health occupies an interesting role, however, as it serves both as a motivator and as a barrier to meat restriction. Health can be a motivation for current vegetarians (Asher et al., 2014b, p. 6) and is also a main motivator for a reduced-meat diet (Faunalytics, 2007, p. 6; Lea et al., 2006b, p. 828). Conversely, health is also one of the main barriers to the adoption of a reduced-meat (Faunalytics, 2007, p. 7) and a meat-free diet (Cooney, 2014, p. 82; Faunalytics, 2007, p. 8; Humane League Labs, 2014, p. 14) and also serves as a main reason that former vegetarians give for lapsing from their diet (Asher et al., 2015, p. 4). Other research, however, has found health concerns to be a relatively low barrier for the adoption of a reduced-meat diet (Lea et al., 2006b, p. 831).

A potential explanation for why a chicken-free diet did not score as high on health perceptions could be because it is viewed as a healthy food, and so its removal could be thought of as problematic for health, in contrast to red meat which comes under fire far more often. Indeed, research has shown that the “public views chicken as a healthy food” (Ball, 2015b, p. 3) and that “people think ‘eating healthier’ means replacing red meat with chicken” (Ball, 2015b, p. 4). Another possible reason is that a chicken-free diet is the least well-known of the three diets and so individuals likely have yet to form an opinion on the health benefits of removing chicken from their diet.

5.7.12 Cost (External Perceptions)

A reduced-meat diet had the best score for cost, indicating that these respondents had the least concern that it would cost too much to eat this way. It is not surprising that a vegetarian diet did not score similarly given that research has shown high costs to be a barrier to the adoption of vegetarianism (Humane League Labs, 2014, p. 13). Additionally, cost concerns are also a reason that former vegetarians cite for lapsing from their diet (Asher et al., 2015, p. 7). Notably though, worries about cost have surfaced as a barrier for the adoption of both a vegetarian and reduced-meat diet, with specific concern about meat alternatives costing too much (Faunalytics, 2007, p. 13).

Paradoxically, research also indicates a relationship between rising employment and increased meat consumption as individuals report cost concerns to be a factor in their choice to eat less meat given worries about the high price of meat (Faunalytics, 2007, pp. 18 & 34). A potential distinguishing factor on the topic of cost concerns is the type of meat restricted diet non-reducing omnivores envision following, in that many

whole foods alternatives to meat (e.g., legumes) are relatively cheap in comparison to more specialty substitutes such as plant-based meats.

5.7.13 Motivation (External Perceptions)

A reduced-meat diet and a chicken-free diet had the highest scores on motivation, indicating that these respondents had the least concern that it would be difficult for them to stay motivated enough to eat this way. It is not unexpected that a vegetarian diet would rank lower on this measure given that it is the more restrictive option. The fact that the other two diets shared this lead position is interesting however given the presumed greater degree of mystery around a chicken-free diet.

5.7.14 Identity (External Perceptions)

A vegetarian diet and a reduced-meat diet had the highest score on identity perceptions, indicating that these respondents were more likely to say that they would see these diets as part of their identity. It is not unexpected that the vegetarian diet would have a strong identity piece given that it is a well-recognized diet. Identity has been shown by Cherry to be a factor in young people's initial adoption of a vegan diet (2015, p. 55) as well as a distinguishing factor among subgroups of vegans (2003, p. i). Given the newness of the chicken-free diet concept, it is also not unexpected that non-reducing omnivores might have difficulty envisioning themselves strongly identifying with this diet. The reduced-meat diet's high score on identity perceptions speaks to the potential benefits of initiatives like the Reducetarian Foundation, with its efforts to cultivate an identity for meat reducers, or, as they refer to them (with this goal in mind): reducetarians.

Although the data does not speak to the underlying forces at play, the relative prevalence of these different diets may relate to the dynamics of personal identity in terms of the juxtaposition between gaining identity by perceiving oneself as part of the mainstream versus gaining identity from the sense that one is part of an exclusive group. A reduced-meat diet would fit best with the former given that a third of American adults self-identify as reducing their meat consumption, while the vegetarian and chicken-free diets speak most to the latter with prevalence rates hovering around 1% each.

5.7.15 Perception of Prevalence Rate (External Perceptions)

Those not restricting their meat consumption believe that vegetarianism is 23 times more prevalent than it is among American adults. The fact that individuals think vegetarianism is more “normal” than it is, is unsurprising given that it is a well-recognized diet, particularly in comparison to the other two, though as mentioned previously the prevalence rate is a fraction of the rate for meat reducers. The gap between the perceived and actual rate for chicken avoiders was also high, a finding that is unexpected given that this diet is relatively unknown. If it is indeed the level of societal knowledge about a diet that predicts overestimation, this hypothesis can explain the vegetarian diet finding, but not the results for the chicken-free diet.

The estimate for meat reducers was close to the actual figure, suggesting that the American public has an accurate understanding that meat reducers account for roughly a third of the adult population. Although not used before with meat-restricted diets, this type of exercise has been employed elsewhere to demonstrate that perceptions do not always match reality with everything from teen pregnancy and immigration to voting and murder rates (Ipsos MORI, 2014).

5.7.16 TTM SOC (*External Perceptions*)

The TTM SOC assesses various stages of change including both cognitive (precontemplation, contemplation, preparation) and behavioural stages (action and maintenance). Non-reducing omnivores were evaluated in terms of the former and were found to be further along the stages of change continuum for a reduced-meat diet than the other diet patterns. A greater proportion of respondents who were asked about a reduced-meat diet were in the contemplation (i.e., I am considering adopting) or preparation (i.e., I have decided to but have not yet adopted) stages than for the other two diet paths.

Most respondents were in the precontemplation stage of cognitive change (i.e., “I am not thinking about adopting”), suggesting that Americans who are not restricting their meat consumption are not actively demonstrating a readiness to change their diet in this regard. Although the stages of change model has not been used before to compare the placement of different meat-restricted diets, other research has used the model to assess consumers’ readiness to reduce their meat consumption (Lea et al., 2006a, p. 342; Tobler et al., 2011, p. 676).

5.8 Internal Experiences (Current Impact)

The topic of internal experiences references the lived understandings of those currently eating one of the meat-restricted diets regarding food satisfaction, social ties, barriers, etc. A vegetarian diet had the strongest internal experiences among American adults who are currently eating one of these meat-restricted diets. The biographical domain portion of the literature on social movement outcomes centres around “the impact of mobilization on the lives of sympathizers and participants in social movements” (Bosi &

Uba, 2009, p. 410). This highlights the importance of considering the different lived understandings that meat restrictors have regarding their diet in order to appreciate the satisfaction levels of the existing base of adherents.

A possible explanation for why vegetarians report better experiences with their diet—even given high lapsing rates (Asher et al., 2014b, p. 4)—is that they have a strong resolve due to the degree to which their diet is restrictive and thus necessitates positive associations to persist. Future research should examine whether there are differences in the levels of determination experienced by vegetarians, meat reducers, and chicken avoiders to bring evidence to bear on this account. The finding that meat reducers ranked the lowest on lived experiences is surprising in some ways, especially given the inherent flexibility of the diet and the fact that it does not position its adherence as far outside the mainstream as a more restrictive diet like vegetarianism.

One hypothesis for why the chicken-free diet had better internal experiences than the reduced-meat diet is that many chicken avoiders are near-vegetarians due to the high prevalence of pescetarianism among the group, which means that they may share some similar experiences with vegetarians. Importantly, for external perceptions, a chicken-free diet is not presented to non-reducing omnivores as including a pescetarian diet and so it is unsurprising that this diet had the weakest perceptions among those not restricting their meat consumption given the novelty of the diet and the fact that pescetarianism was not specifically addressed. Of note, the effect sizes for internal experiences were higher on average than for external perceptions, which is not unexpected given that it is easy to hypothesize that current meat restrictors would have stronger impressions than non-reducing omnivores who were asked to consider a hypothetical situation.

Notably, the same diet cannot be said to have both the best external perceptions and internal experiences. While non-restrictors believe they will be most contented on a reduced-meat diet, those who are currently eating a reduced-meat diet are less satisfied than their vegetarian and chicken-avoiding counterparts. One possible explanation is that certain types of individuals are drawn to a vegetarian or chicken-free diet and bring with them a stronger resolve, which separates them and their experiences from non-restrictors. Under such a scenario, if the prevalence rates for a vegetarian and chicken-free diet increase in future without the help of this “low-hanging fruit,” it may be that the satisfaction rate for vegetarians and chicken avoiders will level off. Exploring this discrepancy and possible explanations would be a fruitful avenue for future research to help address how advocates should respond, i.e., by making use of non-reducing omnivores’ heightened perceived expectations for meat reduction or by promoting the diet(s) with the better internal experiences.

5.8.1 SWFL (*Internal Experiences*)

A vegetarian diet had the highest level of SWFL for internal experiences. This is an interesting finding in some respects given that being unsatisfied with food is a reason that former vegetarians give for lapsing from their diet (Asher et al., 2015, p. 3). Though conversely, taste preferences have also been found to be one of the principal motivations for current vegetarians (Asher et al., 2014b, p. 6). The SWFL scale does not unpack the various facets of food-related life satisfaction, which may have provided further insight on this matter. The scale’s individual items are more general in nature, covering things such as being pleased with or getting satisfaction from food/meals, having food/meals be

close to ideal or a positive element in one's life, and having excellent life conditions regarding food.

5.8.2 *Social Ties (Internal Experiences)*

The vegetarian diet performed best on social ties, which asked participants to indicate to what extent they have strong and extensive ties to people who eat the same diet. The vegetarian diet's superior performance on this measure is not unexpected given the multitude of support networks and other types of social supports that exist for vegetarians both on and offline. In other ways, this is surprising considering that research has shown that close to three-quarters of current vegetarians report not being "actively involved in a vegetarian/vegan group or organization (potluck, online community, etc.)" (Asher et al., 2014b, p. 7). However, social ties need not take the form of organized supports, but rather can include those already in an individual's social circle such as partners, friends, colleagues, etc. In this case, the expectation might have been that meat reducers would outperform the others given their much higher prevalence in the American population. Ultimately, given the comparative nature of the research question, it matters not whether the ratings are especially high but rather which diet has the better performance relative to the others. This research is the first to provide such data and so the existing literature is limited in the extent to which it can help situate and explain the comparative findings.

5.8.3 *Intentions (Internal Experiences)*

A vegetarian diet had the highest level of dietary maintenance intentions. This is a surprising finding given that vegetarians were also found to have a higher lapsing rate

(93.7%) than chicken avoiders (72.1%) and meat reducers (32.9%). Perhaps some of the differentiation stems from a gulf that exists between wanting to continue the diet (which may have been more top of mind as respondents answered the survey) and facing unexpected obstacles in practice that challenge this resolve.

5.8.4 *Attitudes (Internal Experiences)*

A vegetarian diet had the highest levels of positive attitudes, determined by asking respondents to rate their overall feelings towards their diets on four five-point scales ranging from: bad to good, harmful to beneficial, unpleasant to pleasant, and unenjoyable to enjoyable. This finding may be able to be explained if vegetarians could be shown to have stronger motivations for their diet choice than the other two diets, which brings more resolve and positive associations, something that future research could help address. There is an important distinction between current and former vegetarians which warrants mentioning however, which is that while current adherents seem pleased with their diet (at least comparatively so), the overwhelming majority will lapse in time as demonstrated by this study as well as Asher et al., (2014b, p. 4).

5.8.5 *Perceived Behavioural Control (Internal Experiences)*

Both a vegetarian diet and a chicken-free diet had the highest perceived behavioural control, which relates to personal control, capability, and the perceived ease or difficulty respondents feel they have over continuing to follow their diet in future. This is unexpected given that (certainly for vegetarianism), the diet is more restrictive than a reduced-meat diet and so the obvious assumption would be that adherents would feel

less personal control over continuing to eat that way, particularly given that the lapsing rates are higher.

Conversely, it could also be that the resolve is higher for these individuals—particularly those who have ethical motivations—and thus their commitment drives their feelings of control. Vegetarians may have also spent time *learning* how to be successful on their diet given its higher demands and being further along on this learning curve may impart a feeling of control over continued adherence. Indeed, Boyle has shown that early vegetarians, without the necessary coping mechanisms developed are “still learning the how and the why of the vegetarian way” (2011, p. 321) and that, similar to any type of behaviour change, “there should be a learning curve in which people will only acquire more information in order to participate in the lifestyle more effectively” (2011, p. 330). Indeed, sticking with this learning curve may be a marker of the strength of one’s convictions. As Edwards notes, “the learning curve is steep for new vegetarians [...] but the fact that those who have chosen to be vegetarian or vegan are willing to deal with the added anxiety and stress of living in a majority meat-eating society may indicate the strength of their feelings surrounding food and eating” (2013, p. 118). Edwards adds that “if it is easier and more convenient to eat meat, yet someone still [chooses] not to, they clearly have a strong commitment to their reasoning” (2013, p. 118). This study is novel in providing comparative information on perceived behavioural control for the three diets and so future research could help explain some of the mechanisms at play here.

5.8.6 Subjective Norms (Internal Experiences)

Both the reduced-meat diet and the vegetarian diet had the highest scores for subjective norms, which relates to whether the important people in respondents’ life think they

should eat their diet and to what extent they want to eat what the important people in their life think they should. In some ways, this is not surprising given that these diets are more common in mainstream culture than a chicken-free diet and so it is conceivable that the important people in their life are more likely to think they should eat this way. Though the fact that there can often be push-back from families, especially in response to vegetarianism (Hirschler, 2011, p. 162; Jabs et al., 1998, p. 186; Roth, 2005, p. 183), does make this finding less obvious.

5.8.7 Convenience (*Internal Experiences*)

A chicken-free diet along with a vegetarian diet had the highest scores for convenience, indicating that these respondents had the least concern that it is inconvenient for them to eat their diet. Vegetarianism's higher score for convenience is unexpected given that it is one of the reasons former vegetarians cite for abandoning their diet (Asher et al., 2015, p. 6), though that study does not offer comparative data. Some research that does offer this shows that semi-vegetarians and vegetarians are equally likely to report a lack of options when eating out as something that made it difficult to eat meat-free meals (Humane League Labs, 2014, p. 34).

A possible explanation for why a reduced-meat diet performed worse on this measure is that a learning curve could be at play. If individuals take the time to learn how to eat a more restrictive diet such as a vegetarian diet and—at least for the pescetarians among them—a chicken-free diet, it may become convenient because they actively worked to make it so. For convenience and other topics, if these more restrictive diets come with deeply held motivations (particularly ethical ones), this could also be clouding out some of the nuisances, whether in practice or at least by limiting

individual's willingness to readily admit to them because the commitment is so strongly cemented. The novel aspect of this study means that more work is needed in future to explore what is underpinning such findings.

5.8.8 Social/Personal Life (Internal Experiences)

A chicken-free diet had the best score on social/personal life experiences, indicating that these respondents had the least concern that their diet creates issues in their social and personal life. It is difficult to theorize with the data at hand about why chicken avoiders would be the least likely to report that their diet was creating issues in their social and personal life, and so is an area ripe for future research. While there was no difference on this measure between vegetarians and meat reducers, other research has demonstrated that semi-vegetarians (similar to but not the same as meat-reducers) are slightly more likely than vegetarians to report a lack of support from family and friends as making it difficult to eat meatless meals (Humane League Labs, 2014, p. 34). Semi-vegetarians were also much more likely than vegetarians to say that people around them who consume meat proved to be a difficulty (Humane League Labs, 2014, p. 34).

While vegetarianism performed best on the social ties measure, this was not the case for the social/personal life measure. This underscores the difference between the two with social ties speaking to the extent to which individuals have strong and extensive ties to people who eat their diet, while the latter relates more so to conflicts that can arise.

5.8.9 Health (*Internal Experiences*)

A vegetarian diet had the best score on the question that asked respondents if they thought their diet was good for their health. It is surprising that vegetarians are most likely to cite that their diet is good for their health, given that health concerns are a commonly cited reason for lapsing from vegetarianism (Asher et al., 2015, p. 4). However, health is also a common motivator for eating a vegetarian diet (Asher et al., 2014b, p. 6), which makes it a particularly interesting paradox and thus a fruitful area for future research. This study is the first to provide comparative data on the topic and so while past literature has cited how health serves as a motivation and as a barrier to vegetarianism, this study is the first to describe the role of health experiences across the three diets under study.

Work by the Humane League Labs has shown that a larger proportion of semi-vegetarians than vegetarians report first eating their diet for health reasons (2014, p. 15), a trend that also holds when looking at the prime reason people cite for adoption (2014, p. 16) as well as reasons given for diet maintenance (2014, p. 22). In contrast, semi-vegetarians are also slightly more likely than vegetarians to report health concerns as an issue that made eating meatless meals difficult (Humane League Labs, 2014, p. 34). It is possible that because of the commitment required, vegetarians spend more time learning how to thrive on their diet. Cherry's (2003, p. 38) research with punk vegans found that many "originally went vegan after learning about animal rights, and later learned how to be a healthy vegan." In these cases, they "dove into veganism headfirst" after which they learned how to eat well as a vegan and began to realize the unanticipated health benefits (Cherry, 2003, p. 38).

5.8.10 Cost (Internal Experiences)

Both the chicken-free diet and the vegetarian diet had the best scores for cost experiences, indicating that these respondents were the least concerned that it costs too much to eat their diet. This is interesting given concerns about the cost of meat substitutes (Faunalytics, 2007, p. 13). Yet there are also concerns about the price of meat (Faunalytics, 2007, p. 34), so cost encompasses contradictions. Cost is also a reason that former vegetarians cite for lapsing from their diet (Asher et al., 2015, p. 7). The finding that a reduced-meat diet performed the worst on this measure is unexpected given the presumed flexibility that this diet provides adherents to eat meat or not, including of any type, when cost as well as other factors dictate.

As with health, there could be a learning curve at play here where vegetarianism and the more restricted types of chicken avoidance such as pescetarianism may require deeper commitment for the “how” of eating. Indeed, Cherry (2015, p. 57) points to the need to learn new ways of “cooking, eating, and making everyday purchases” as a new vegan. She cites maintenance and retention as partly hinging on having “cultural tools that provide the skill and motivation to remain a vegan” (Cherry, 2015, p. 56). In this way, vegetarians and chicken avoiders may view their diet as not too costly because they have over time taught themselves how to expertly navigate this very issue.

5.8.11 Motivation (Internal Experiences)

A vegetarian diet and a chicken-free diet had the highest scores on motivation, indicating that these respondents were least likely to say that it is difficult for them to stay motivated enough to eat their diet. It is not surprising that vegetarians were the least likely to report difficulty with motivation given that a majority cite ethical reasons as a

motive for their adherence (Asher et al., 2014b, p. 6). Though their high lapsing rates do suggest that this may be short-lived. Indeed, a lack of motivation has been cited by former vegetarians as a reason for their lapse (Asher et al., 2015, p. 8). Further, there is a difference in self-reported animal protection motivations for current (68%) versus former (27%) vegetarians (Asher et al., 2014b, p. 6), which could indicate that motivations dissipate over time.

It is possible that a strong commitment is driving a portion of chicken avoider (notably pescetarians) as well. Indeed, chicken avoiders' reasons for their diet choice were ethical motivations and taste preferences, followed by health concerns. Research shows that semi-vegetarians are more likely than vegetarians to report a loss of initial motivation as something that made it difficult to eat meatless meals (Humane League Labs, 2014, p. 34), which is supported by the finding that meat reducers had the lowest scores on motivation.

5.8.12 Identity (Internal Experiences)

A vegetarian diet had the highest score for identity experiences, indicating that these respondents were more likely to say that they see their diet as part of their identity. This is not unexpected given the suggested association between identity and vegetarian diet maintenance. Asher et al., (2014b, p. 7) showed that a much smaller proportion of current vegetarians (11%) say they do not see vegetarianism as part of their identity compared to 58% of former vegetarians (who answered about the experiences they had at the time of their diet adherence). It is important to note, however, that not all vegetarians strongly identify with their diet, e.g., someone who is instructed to eat this way by their physician.

The Reducetarian Foundation is working to promote the term *reducetarian* to help nurture a meat reducer identity and in turn increase levels of uptake and adherence, i.e., using identity to drive practice. Though it may be more challenging to cultivate a sense of identity for meat reducers given that it is a less tangible behaviour change than vegetarianism. If, for example, an individual quits smoking they can identify as a non-smoker, but reducing one's smoking would presumably have less of an identity component. The same could hold true for meat consumption.

Further, some believe that cultivating an identity around food can have damaging effects, particularly for meat-free diets where small differences in consumption are exaggerated to render membership in the diet group more exclusive which creates tensions between factions (Leenaert, 2015b). Interestingly, some individuals maintain their dietary identity even in the face of gaps in adherence. Cherry (2006, p. 160) explains that some vegans have “constructed idiosyncratic, personal definitions of veganism” which allow them to preserve “their vegan identity, even while eating non-vegan food.” Greenebaum (2012b) discusses how an authentic identity is maintained by ethical vegans even as they face inconsistencies in their own vegan diet and lifestyle purity. In such instances they “engage in a process of accommodation strategies to justify their own sense of authenticity” by setting themselves apart from health vegans and “when they fail to live up to their standards, they alter their public behavior, they define a community ‘gray area,’ and they blame the social structure” for not offering suitable replacements (Greenebaum, 2012b, p. 132).

Cherry's (2006, p. 155) research also indicates that identity may not play as chief a role in maintenance as some suggest, explaining that “maintaining participation in the vegan movement depends more upon having supportive social networks than having

willpower, motivation, or a collective vegan identity.” For Cherry (2006, p. 167), the “success of the vegan movement is predicated on maintaining lifestyle changes in practice and not just in identity.” She has noted that the animal protection movement is not an identity movement in that advocates do not want newcomers to solely identify as vegetarians or vegans, but rather “attempt to encourage more people to reconsider human relations to other animals, and to modify their behavior accordingly” (Cherry, 2016, p. 71).

There are some cultural trends that suggest that the vegetarian identity is influential, specifically the use of the vegetarian identity by non-vegetarians, which may be indicative of its power, or at least its presumed power. Greenebaum recalls how prominent health-motivated meat-reducers “appropriate the terminologies and identities of vegetarians and vegans and identify as a semivegetarian or a flexitarian” (2012a, p. 310). She cites “vegan(ish)” and “vegan till 6” as further examples of this trend (Greenebaum, 2012a, p. 310). Greenebaum views this as an important cultural development given that vegetarians and vegans have, until recently, been stigmatized (2012a, p. 310).

Interestingly, this appropriation does not seem to have the same effect in the food marketing space. Research has shown that when used for meatless products, the term vegetarian “has a negative effect on how the consumer perceives the food” (Ball, 2015b, p. 12). Perhaps this is related to the fact that vegetarian and vegans continue to be viewed in a negative light whether it is stereotyping to do with competence and warmth (MacInnis & Hodson, 2015, pp. 6 & 12), conceptualizations of vegans as “killjoys” (Twine, 2014), views of vegans as “angry, fanatical, judgmental” (Ball, 2015b, p. 3), or the existence of vegaphobia (Cole & Morgan, 2011). The competing literature on

identity leaves some uncertainty as to whether it is helpful for advocates to promote vegetarianism as an identity and for conceptions of a meat reducer and chicken avoider identity to follow suit.

5.8.13 Perception of Prevalence Rate (Internal Experiences)

Chicken avoiders believe their diet is 23 times more prevalent among American adults than it is—the biggest difference among the diet groups—which is noteworthy given that the diet has not yet permeated the mainstream. Why chicken avoiders believe their diet is so much more “normal” remains unanswered. One possible explanation is that the pescetarians among them are driving this finding given that pescetarianism has more name recognition. It is also possible that vegetarians fell behind because many (particularly in smaller centres and rural areas) are aware that their numbers are small given the lack of social supports and meatless options, which leaves them with an impression that their diet remains on the fringes.

5.8.14 Length of Diet Adherence (Internal Experiences)

Chicken avoiders have the longest self-reported diet adherence, followed closely by vegetarians, while reducers report a notably shorter timeframe. Chicken avoiders’ longer adherence could speak to their strongly held motivations around the diet. Indeed, the reasons for their diet choice are ethical motivations and taste preferences, followed by health concerns. As demonstrated in the next section, the lapsing rate for chicken avoiders is quite high by contrast, perhaps suggesting that while there is a fair bit of turnaround, the longer-term adherents may show deep commitment.

5.8.15 Diet Lapses (*Internal Experiences*)

Meat reducers have the lowest lapsing rate—about a third who take on the diet later abandon it—compared to lapses among close to three quarters of chicken avoiders and nearly all vegetarians. The lapsing rate found for vegetarians in this study is higher than in previous research (Asher et al., 2014b, p. 4). The discrepancy could be because the current study did not use a food list verification to confirm past vegetarianism, which could lead to an over-representation. This is not an unlikely prospect given the propensity of individuals to erroneously self-report adherence to vegetarianism as discussed elsewhere.

Importantly, lapses may not be overly problematic from a farmed animal protection standpoint if individuals maintain their former diet in some way. For example, research has shown that former vegetarians may be better thought of as meat reducers or even a semi-vegetarians (Asher et al., 2016, p. 2). In this way, while they no longer eat an entirely meat-free diet, they are still making dietary contributions in some form. Accordingly, the marker of progress may be better thought of as the extent to which individuals increase the amount of diet-appropriate food they eat, rather than ensuring that this consumption is consecutive or flawless.

5.9 Chicken Avoiders

Because chicken avoiders represent a new area under study, it is worthwhile to use what information is available in the survey to better understand this population. It is noteworthy that these individuals represent roughly the same proportion of the U.S. adult population as vegetarians, yet far less is discussed in mainstream culture about chicken avoiders. The research showed that among chicken avoiders, around half

(50.8%) are pescetarians, while close to another half (45.4%) have some red meat in their diet—eating (at least) beef or pork—and a remaining 3.9% of chicken avoiders follow a different dietary pattern.

Some of the chicken avoiders suggested in the open-ended questions that they conceive of pescetarianism as equivalent to vegetarianism and do not identify fish or shellfish as meat or even animals. Comments to this effect (from respondents who eat fish and/or shellfish but no other meat) include believing they “do not eat animals” and give their reasoning as being that they “do not want to kill animals for food,” or that they find it “unnecessary and cruel to eat something that was once living and had feelings,” and one even reported “we are animal rescuers and found it to be highly hypocritical to eat meat. Animals are our friends and we don’t eat our friends. EVER.”

Given that fishes are small-bodied animals and vastly outnumber chickens in the food supply, this oversight may have consequences for efforts to raise concern on ethical grounds about eating fish. Many chicken avoiders cited ethical reasons for not eating chicken, however many of these individuals also ate fish and/or shellfish, which suggests these animals are outside their circle of moral concern. Though if individuals are ethically motivated, it indicates that they may be open to arguments about why consuming small-bodied animals such as fishes could present a moral dilemma.

It is unsurprising that a chicken-free diet lagged the others, especially for external perceptions. Several non-reducing omnivores randomized in this path noted that a chicken-free diet seemed to be an unusual subject, saying things like: “I didn’t realize a chicken free diet was a thing” and “Is this a new fad? I haven’t heard anything about chicken-free diets.” Though other comments seemed to reflect the diet’s potential given sufficient education: “I could become a chicken free diet eater if I have more

information about why we shouldn't eat chicken;" "I had never heard of a chicken-free diet and am going to look it up now to learn more;" and "I always thought it was beef that is a culprit. This survey left me wanting to get a better understanding of the risks associated with Chicken."

5.10 Limitations

Importantly, this study cannot speak directly to the effectiveness of *promoting* a meat reduction or elimination message given that this was not an intervention study. Rather, it can address in some ways what diet holds the most promise outside of a consideration of which call to action (if any) helped bring it about. The non-causal design of the study presents a limitation to the findings and their reach. Helpfully, however, there are other studies that have examined this question of messaging using causal designs.

The first tested the impact of four types of messaging requests—veganism, vegetarianism, meat reduction, and a mixed message to “cut out or cut back on meat”—along with a control group (Doebel et al., 2015, p. 2). The dietary intervention was a booklet handed out on college campuses in Massachusetts and impact was primarily measured in terms of the extent to which individuals changed their consumption of five types of animal products between the baseline assessment and a follow-up between two and four months later (Doebel et al., 2015, p. 2). The study's conclusions suggest that the “cut out or cut back on meat” message results in the greatest decrease in total animal product consumption. However, the only statistically significant difference in this regard appeared to be when comparing this combined message to the vegetarian message. Likewise, the control group showed the greatest total decrease in animal product

consumption, which raises questions about the value of the results (Doebel et al., 2015, p. 3).

A second study examined the effects of a meat reduction versus elimination appeal using a three-way experimental design (Macdonald et al., 2016, p. 1). The research was conducted with a sample from Amazon Mechanical Turk in 2016 and the main outcome measure was a 30-day FFQ (Macdonald et al., 2016, pp. 2–3). The study found that both appeals resulted in significant decreases in self-reported meat intake, however there was no observed effect between treatments (Macdonald et al., 2016, p. 1).

A final study tested three messages on an Amazon Mechanical Turk sample using 48 pro-animal videos: “Please leave animals off of your plate,” “Please cut out or cut back on animal products,” and “Please choose vegan,” along with a condition that had no call to action (Caldwell, 2017). The findings showed there were no statistically significant differences for intentions to reduce meat consumption, for requests for a vegetarian starter guide, for attitudes towards farmed animals and meat-free meals, or for the combined outcome, possibly due to power constraints (Caldwell, 2017).

Another major limitation of the current research is the discrepancy in diet data for meat reducers, where—when using the transformed FFQ variable—they self-reported eating more daily servings of meat than the U.S. population, the omnivore population, and the non-reducing omnivore population. The methodology used to assess self-reported meat consumption and theories for this seemingly unintuitive result are discussed in APPENDIX E – Meat Reducers Diet Discrepancy. The limits of self-reported dietary recall data may pose limitations for other areas of the dissertation that also relied on the FFQ findings.

This incongruity meant that the two farmed animal impact indicators were not able to be assessed as discussed in the Results Chapter. While the findings for vegetarians and chicken avoiders were presented for farmed animal impact, these bring notable limitations because of concerns about the data for meat reducers, and so should be used with caution. The conversion approach for the FFQ presents notable limitations, particularly when used to derive a precise number of animals impacted from an imprecise measure such as self-reported diet. The exclusion of sea animals from this analysis also has shortcoming. The use of United States Department of Agriculture data also presents limitations because of the exclusion of some land-based animals who are used for food (e.g., rabbits) as well as other specificities in the data, e.g., whether it includes or excludes slaughter on farms. There is, however, no superior alternative given that this federal data is the most robust source of farmed animal statistics for the U.S.

An additional central limitation of the study are the variables used to operationalize each indicator, and indeed the indicators themselves. The Materials section of the Methods Chapter offers a discussion of why each sub-indicator was chosen. Importantly, it is recognized that other variables or different combinations of existing variables could have been equally acceptable and this may have notably changed the dissertation's conclusions. As such, it is essential to view the findings with an understanding that they are only relevant for the precise indicators under examination and the specific ways in which they were operationalized.

Potential limitations also stem from the analytic approach, including the use of independent one-way ANOVAs and pairwise comparisons (given the assumptions of the tests) and the choice to present means rather than examining frequency distributions. The weighting procedure and the data cleaning conducted after weighting is also a

potential shortcoming, as discussed elsewhere. Limitations may have resulted from the decision not to delete items from a multi-item scale originating from the existing literature in instances when the reliability test indicated that deleting an item would increase the scale's reliability. The approach for converting the answers to the intentions to an estimate of the percentage of non-reducing omnivores who will adopt one of the diets in future also brings restrictions as does the assumption that intentions will translate into behaviour. The procedures for calculating the proportion of opinion leaders and the number of meatless meals per week also has potential shortcomings. Finally, different analytic approaches may have resulted in different findings.

An added limitation of the study is that because chicken avoidance is not yet seen in the culture as a proper dietary choice—the way vegetarianism and increasingly meat reduction is—asking about external perceptions may have put the diet at a disadvantage. Indeed, one reason a chicken-free diet had a lower score may have been that respondents were “unlikely to have formed the attitude being asked about” (Willis & Lessler, 1999, p. 11). The exploration of chicken avoidance to the exclusion of chicken reduction may have also presented limitations because the latter may have been a more appealing option to non-reducing omnivores.

The way meat reducers were operationalized may have resulted in limitations because of the high reliance on self-identification. In addition, the choice to use “vegetarian” as the overarching term rather than giving equal weight to veganism could have notably shaped respondents' views about a meat-free diet. To what extent this may have changed the findings is uncertain because while veganism appears to be experiencing a bigger uptick in interest in the U.S. than vegetarianism (Google Trends, n.d.), vegans also appear to be more stigmatized than their vegetarian counterparts

(MacInnis & Hodson, 2015, p. 1). Other ways in which topics were measured may have also presented limitations, including the choice to assess the consumption of meatless meals by inquiring about total meals and total meat-based meals and the decision to probe the precise length of dietary adherence rather than offering ranges as answer options.

Measurement error is common in surveys especially when few survey questions are used to assess a concept (Hox, 2008, p. 387). Some concepts in this survey were measured using relatively few questions, which presents a limitation for these constructs. Shortcomings also stem from the use of self-reported data outside of the dietary information, notably the behavioural intentions question.

As discussed in the Methods Chapter, there are many limitations that come from using an online opt-in nonprobability-based sample with population targets, particularly when making inferences about the distribution of variables in society. There were also limitations to the randomization process. Although it resulted in a balanced assignment for the most part, there were exceptions. The inability to test the study using cognitive interviewing with a current chicken avoider also presents a limitation of the study. It is also possible that the online consent screen (though generic) biased who took the survey, with those more interested in diet opting to proceed in greater numbers, which could have impacted the IRs. However, only a very small proportion (0.9%) of respondents did so (288 out of 30,689 respondents in the original dataset), which limits concerns on this front. Finally, it is important for readers to be aware that most of the results are meant to show estimates rather than to serve as precise figures. Likewise, the results are most telling when used to compare across diets, rather than being viewed as standalone figures.

5.11 Concluding Summary

This chapter discussed the dissertation's findings with a consideration to how they integrate with the current literature on the topic as well as which findings were particularly unexpected. The results suggest that there are reasons to infer that a reduced-meat diet may best support an EAA approach to dietary outreach in the U.S. For many of the indicators, the reduced-meat diet's dominance was driven by the high proportion of current meat reducers, which is an important lens through which to consider the findings and their limitations. Lived experiences was the one exception to the meat reducers trend, with a vegetarian diet showing the best internal experiences among American adults who are currently eating one of the three meat-restricted diets. There were no indicators on which a chicken-free diet ranked above the others. The two farmed animal impact indicators were not able to be assessed, however, even if these indicators were measurable and one of the diets other than meat reduction ranked the highest, this would not have changed the dissertation's overarching conclusion.

6.0 CONCLUSION

Despite decades of promotion, rates of vegetarianism have changed minimally in the U.S. In part due to the slow growth in the rates of vegetarianism, there are deep divisions among farmed animal advocates concerning whether encouraging meat elimination or meat reduction (and which type) is best. This research provided an example of how effective altruism has the potential to inform social movement goals—in this specific case through a better understanding of the impact of dietary choices, perceptions, and experiences—and speaks to the bigger-picture question of whether social movements should ask for intermediate steps or focus on their desired end goal.

Following Voltaire’s assertion that the perfect can be the enemy of the good, this research explored whether vegetarianism (the perfect) may be the enemy of the good in terms of realizing advocates’ desired social movement outcomes in American society around meat and farmed animals. This research—positioned at the intersection of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change—examined this research problem. It did so by drawing on applied sociology, which uses sociological methods and inquiry to answer real-world social problems.

The research was informed by effective altruism and its commitment to “doing good better.” However, doing good in terms of meat consumption and reduction can encompass many topics, including animal protection, the environment, human health, world hunger, and social justice. Further, progress on one front may impede that of another. Given these contradictory goals, the dissertation isolated the animal protection frame as the primary mechanism by which to measure effectiveness for these purposes.

As such, this research used an EAA lens to study the current and future potential impact of three diets promoted (to varying degrees) by U.S. advocates: a vegetarian diet, a reduced-meat diet, and a third option, a chicken-free diet (worthy of exploration given the problem of smaller-bodied animals).

Consideration was given to how these diets help the movement “do the most good,” a key tenet of effective altruism. To explore this question, data was collected on the Qualtrics platform from an online census-balanced cross-sectional sample of more than 30,000 U.S. adults 18+ years of age provided by Nielsen in the fall of 2016. Six groups of respondents were isolated in this sample: American adults who ate one of these meat-restricted diets (vegetarians, meat reducers, and chicken avoiders), and American adults who were not restricting their meat consumption and who were randomized into one of three survey paths (non-reducing omnivores asked about a vegetarian diet, non-reducing omnivores asked about a reduced-meat diet, and non-reducing omnivores asked about a chicken-free diet). These groupings allowed for an exploration of both external perceptions and lived experiences. Current impacts were assessed by surveying meat restrictors and projections were made about future potential impacts by surveying non-restrictors and their adoption intentions.

6.1 Review of Findings

Results suggest that there are reasons to infer that a reduced-meat diet may best support an EAA approach to dietary outreach in the U.S., given the specific indicators considered for this study. When evaluating the current impact of the three meat-restricted diets, a reduced-meat diet had the highest prevalence rate. A third (33.0%) of American adults self-identify as reducing their meat consumption, compared to one

percent each who identify as a vegetarian (1.1%) or a chicken avoider (1.0%). When factoring in potential adoption rates among non-reducing omnivores, meat reducers have the highest expected prevalence rate among American adults (45.0%), compared to vegetarians (8.7%) and chicken avoiders (6.8%).

A reduced-meat diet also had the largest number of food opinion leaders, i.e., those who self-report influencing others' attitudes and choices around food. There was a notably larger number of self-identified food opinion leaders among meat reducers (4.6 million American adults) than among vegetarians (255,000) or chicken avoiders (153,000). A reduced-meat diet was also projected to have the largest number of food opinion leaders based on future potential eating patterns: 7 million food opinion leaders when factoring in those currently in this diet group as well as those expected to transition in future, compared to 1.8 million among vegetarians and 1.4 million among chicken avoiders.

A reduced-meat diet results in the largest number of meat-free meals eaten by American adults each week based on current as well as projected future impact. Meat reducers currently consume the greatest quantity of meatless meals weekly: 446 million meatless meals compared to 42 million for vegetarians and 25 million for chicken avoiders. A reduced-meat diet was also projected to result in the largest number of weekly meat-free meals eaten in future: meat reducers have the potential to consume 607 million meatless meals compared to 327 million for vegetarians and 176 million for chicken avoiders.

A reduced-meat diet was also singled out as leading to the largest number of American adults who eat meat-free meals each week based on current and projected future impact. Meat reducers encompass the largest number of individuals (38 million)

who are participating in meatless meal eating compared to 2.3 million among vegetarians and 1.7 million among chicken avoiders. A reduced-meat diet was also projected to result in the largest number of American adults who will eat meat-free meals in future: 52 million among meat reducers compared to 18 million among vegetarians and 12 million among chicken avoiders.

A reduced-meat diet had the best external perceptions, i.e., views about the diet from American adults not currently restricting their meat consumption. This finding is based on a tally of several metrics. A reduced-meat diet had the highest adoption intentions among non-restrictors. This diet also posed the least concern in terms of being inconvenient or costing too much. Non-reducing omnivores were also further along the stages of change continuum for this diet, i.e., a greater proportion of respondents were in the contemplation (i.e., I am considering adopting) or preparation (i.e., I have decided to but have not yet adopted) stages than for the other two diets. A reduced-meat diet also had the best outcome on subjective norms, which assessed whether the important people in respondents' life think they should eat one of the diets and to what extent they want to eat what the important people in their life think they should.

Both a vegetarian diet and a reduced-meat diet had the best outcome on social ties, i.e., the extent to which non-restrictors reported strong and extensive ties to people who eat the diet in question. These diets also had the most favourable attitudinal ratings on scales ranging from bad to good, harmful to beneficial, unpleasant to pleasant, and unenjoyable to enjoyable. A vegetarian and reduced-meat diet were also pinpointed by respondents as being the best for their health and a way of eating that they would be more likely to see as part of their identity.

A reduced-meat diet and a chicken-free diet had the highest levels of perceived behavioural control, relating to personal control, capability, and the perceived ease or difficulty respondents feel they have over eating one of the diets in the future. A reduced-meat and a chicken-free diet had the highest score on social/personal life perceptions, indicating that respondents had the least concern that eating these diets would create issues in their social and personal life. Their scores were also the highest on motivation, indicating respondents had the least concern that it would be difficult for them to stay motivated enough to eat this way.

Those not currently restricting their meat consumption were most familiar with a vegetarian diet and believed that vegetarianism is 23 times more prevalent than it is among U.S. adults, a rate higher than for the other diets. A vegetarian diet also had the most favourable rating on the attitude thermometer. There was no effect of diet group on SWFL scale, which covered things such as being pleased with or getting satisfaction from food/meals, having food/meals be close to ideal or a positive element in one's life, and having excellent life conditions regarding food.

A vegetarian diet had the best internal experiences, i.e., lived understandings from those currently eating one of the meat-restricted diets. This finding is based on a count of several metrics. Vegetarians had the best outcome on the SWFL scale and were most likely to report a higher degree of maintenance intentions. Vegetarians were most likely to indicate that their diet was good for their health and that they see it as part of their identity. Vegetarians also indicated they have the strongest and most extensive ties to people who eat their diet and they gave their diet the highest attitudinal ratings on scales ranging from bad to good, harmful to beneficial, unpleasant to pleasant, and unenjoyable to enjoyable.

Both vegetarians and chicken avoiders had the highest perceived behavioural control levels, which relate to personal control, capability, and the perceived ease or difficulty respondents feel they have over continuing to follow their diet in future. These respondents also had the least concern that it is inconvenient for them to eat their diet or that it costs too much to do so. In addition, they were least likely to say that it is difficult for them to stay motivated enough to eat their diet.

Meat reducers and vegetarians had the highest scores for subjective norms, relating to whether the important people in their life think they should eat this way and to what extent they want to eat what the important people in their life think they should. Chicken avoiders had least concern that eating their diet creates issues in their social and personal life. These individuals also had the longest self-reported diet adherence and believed their diet to be 23 times more prevalent than it is among U.S. adults, a rate higher than for the other two diets. Finally, meat reducers had the lowest lapsing rate.

6.2 Implications of Findings

This dissertation adds to the EAA literature on meat reduction versus vegetarianism, which has been a topic of deliberation in EAA circles, and does so by examining both current and potential future trends. While a handful of studies have explored this topic using intervention research, this dissertation offers a further perspective from a cross-sectional design. The question of whether to promote reductions or eliminations has, to date, been a foundational, yet unanswered question in EAA circles.

The research also offers insight into a much-debated topic among social movements concerning how to increase impact. This dissertation provides insights broadly into social movement strategy and how social movements can influence impact

for their cause. It examines the question of whether social movements should ask for smaller, intermediate steps, or whether they should focus on their desired end goal. While there is substantial internal dialogue on this matter among animal advocates, there are few studies that provide empirical evidence for consideration. This dissertation offers data that directly addresses this under-studied area and in addition has broader significance for scholars who study social movement strategy and outcomes in a variety of other social justice fields. In so doing, this research recognizes that predicting social movement outcomes is a difficult endeavour, that claims of causality can be misleading, and that change can impact a movement in unexpected ways.

The dissertation's main conclusion stems from the finding that a reduced-meat diet was the standout on five of the six indicators. For many of the indicators, the reduced-meat diet's ascendancy was driven by the high proportion of current meat reducers in the population. In this way, even if another diet (typically vegetarianism) performed better, the results always favoured the reduced-meat diet when the numbers from the current population were factored in, which is an important lens through which to view the results and its limitations.

If the additional changes a vegetarian diet could bring in future were viewed in isolation, rather than in conjunction with current trends, vegetarianism would have surpassed a reduced-meat diet. For instance, the projected increase in expected prevalence rates for vegetarians is eight times higher, which is larger than the expected 1.4-fold change for meat reducers. Similarly, the driving force behind the considerably higher projections for future opinion leaders among meat reducers is the sizeable proportion of current reducers given that while the number of food opinion leaders among meat reducers is projected to see only a 1.5-fold increase, the jump for

vegetarians is expected to be seven times as much. Nonetheless, this dominance—that a third of American adults self-identify as meat reducers—suggests that this may be a powerful group for advocates to harness in terms of their desire to shift customs around food.

The conclusion that a reduced-meat diet had the best external perceptions among American adults who are not currently restricting their meat consumption makes intuitive sense given that meat reduction is a less limiting diet than vegetarianism and a more well-known (or at least easily understood) diet than chicken avoidance. Research has also shown that chicken is considered a more challenging food to remove from one's diet than beef or pork, which may also speak to the impressions non-reducing omnivores had about the chicken-free diet. Likewise, chicken is not forbidden by any religion that allows meat to be consumed in some fashion the way other meats such as pork are restricted.

In terms of lived experiences, a possible explanation for why vegetarians report better experiences with their diet—even given high lapsing rates—is that while still on the diet they may, given its restrictive nature, cultivate more positive associations to persist and to satisfy the host of socially determined needs associated with the consumption of food. An unanswered question is whether the true lived experience is indeed better for vegetarians or if this is a function of skewed perceptions or even denial. The finding that meat reducers ranked the lowest on lived experiences is surprising in some ways, especially given the inherent flexibility of the diet. While vegetarianism is said to fall “outside of the accepted eating patterns in Western nations” (Boyle, 2011, p. 314), a reduced meat diet does not position its adherents as far outside mainstream society when it comes to eating and its followers come into less conflict with social food

norms than more restrictive dietary patterns like vegetarianism. Yet meat reducers' personal experiences may not be felt as deeply as vegetarians'. Perhaps it is a scenario of the less sacrifice and need to work to overcome the learning curve, the fewer personal rewards.

One hypothesis for why chicken avoiders had better internal experiences than meat reducers is that a notable proportion of chicken avoiders are near-vegetarians due to the high prevalence of pescetarianism among the group, which may allow them to share similar personal and social understandings of their dietary life. Importantly, a chicken-free diet was not presented to non-reducing omnivores as including a pescetarian diet. As such, it is unsurprising that the diet had the weakest perceptions among those not restricting their meat consumption given the novelty of the diet and the fact that pescetarianism was not specifically addressed.

It is of note that the same diet cannot be said to have both the best external perceptions and the best internal experiences. While non-restrictors think that they will be most contented on a reduced-meat diet, those who are currently eating a reduced-meat diet are less satisfied than their vegetarian and chicken-avoiding counterparts. A possible explanation is the difference between how vegetarianism is perceived versus experienced. As Paisley et al., note, "from a sociological perspective, food choice is understood as a dynamic, social phenomenon, rather than an individual phenomenon" (2008, p. 80). Because of the way food consumption is woven into our social fabric, Boyle explains that "those who practice vegetarianism must negotiate their decision to participate in behavior outside the norm in similar ways to other people who engage in alternative behaviors" (2011, p. 329). Thus, it is possible that while vegetarianism's position outside mainstream society is daunting to those who are not currently restricting

their meat consumption, this becomes less pronounced for current adherents who have actively worked to overcome obstacles and may hold strong motivations for their dietary choices. Another noteworthy finding is that the effect sizes for internal experiences were higher on average than for external perceptions. This is not surprising given that current meat restrictors understandably have stronger impressions than non-reducing omnivores who were asked to consider a hypothetical situation.

This dissertation found meat reducers to be a larger group than researchers previously imagined. Meat reducers are an important and under-studied segment of the population, which positions this study to contribute to the advancement of scholarly knowledge in this area given that to date the literature in the sociology of food space has focused on vegetarians rather than the potentially influential population of meat reducers.

Likewise, one of the novel contributions of the dissertation is that it offers the first insights about chicken avoidance. This is meaningful considering that this diet speaks to the issue of smaller-bodied animals, a phenomenon that has also become a topic of interest among EAAs⁶⁰ given that U.S. omnivores eat vastly more chickens than other land-based farmed animals such as pigs and cows. This dissertation provides the first reliable estimate of the proportion of chicken avoiders among the U.S. adult population. While this rate was smaller than hypothesized based on the work of Asher et al., (2014b, p. 8), it is noteworthy that these individuals represent roughly the same proportion of the U.S. adult population as vegetarians, yet far less is discussed in

⁶⁰ Of note, there are also concerns among EAAs about smaller-bodied animals such as fish and insects (Animal Charity Evaluators, 2014b).

mainstream culture about chicken avoiders or even pescetarians who make up half of all chicken avoiders.

This research's examination of chicken avoidance is made more innovative by its focus on both the lived understandings of current avoiders and the perceptions by outsiders. While the diet did not outperform the others on any of the indicators under study, in terms of external perceptions this may be partly explained because the diet is relatively unknown. Regarding internal experiences, chicken avoidance performed better than a reduced-meat diet, which suggests it may have some unexplored potential. This research is also believed to be the first to offer insights on the impetus for chicken avoidance: ethical motivations and taste preferences, followed by health concerns. It also problematizes concerns about fishes—small-bodied animals that vastly outnumber chickens—given that some chicken avoiders suggested that they conceive of their pescetarianism as equivalent to vegetarianism and do not identify fish or shellfish as meat or even animals.

It was not possible to assess the two farmed animal indicators. This presents a limitation to the research given the important role that farmed animal impact serves in addressing the main research question. Indeed, the number of land-based farmed animals raised for meat removed from the food stream has been cited as one of the key metrics for assessing the efficacy of farmed animal advocacy (Animal Charity Evaluators, 2016a; Cooney, 2014, p. 5). Importantly, however, while information on farmed animal impact is quite valuable in and of itself, its absence in this dissertation does not prevent an overall conclusion from being formulated given the nature of the findings for the other indicators. Had these indicators been measurable and a vegetarian or chicken-free diet ranked the highest, this would not have changed the dissertation's overarching

conclusion because the pre-analysis plan indicated that the standout diet would have the best performance among the eight indicators under study. A reduced-meat diet performed the best on five of these eight indicators, a vegetarian diet on one, and there were no indicators on which a chicken-free diet outperformed the rest. Thus, if the two missing farmed animal indicators had been evaluated and were favourable to a vegetarian diet, this would not have sufficiently improved this diet's overall standing.

Nonetheless, having information on the farmed animal indicators would have imparted data that other researchers and social movement actors could consider in formulating their own opinions about the impact of the diets. For instance, some EAAs may put more weight on the farmed animal indicators than those connected to prevalence rates, opinion leaders, meat-free meals, etc., which is one way in which the missing data could add to the existing literature irrespective of its role in the dissertation's overarching conclusion. Additionally, had the lead held by a reduced-meat diet been narrowed by assessing these indicators, this would have changed the nature of some of the discussions of the findings.

The prevalence rate of vegetarians offered herein is believed to be among the more current and reliable estimates of this population given the nature of the dataset from which it came and the strict procedure used to identify these individuals. The research is also helpful in identifying the proportion of American adults who are not restricting their meat consumption in any of the tested ways, which highlights that the overwhelming majority of Americans are not sufficiently interested in meat restriction to have made adaptations to their diet. This could serve as a notable barrier for future uptake and so is an important finding to consider.

The focus on both current and future potential impact provides different perspectives from which to consider the findings given the importance of understanding the tangible effects being realized now as well as projections for change (using metrics such as intentions and opinion leadership). This is especially salient given effective altruism's interest in the far future. The dissertation built on the work of others by reinforcing the importance of diet not only at the individual level (e.g., the number of vegetarians) but on the more micro level of meals. The extent to which these meals are spread among larger segments of society has been reinforced in this dissertation, following the rationale put forth by strategists that having meatless eating undertaken by more people will do more to help increase its societal impact than the same amount of demand would had it been concentrated in fewer people.

This dissertation is also distinctive in offering an examination of many variables across several diets, observed from both an insider and outsider perspective. In most cases, the same variables were collected across all six survey paths, allowing for a rich comparative dataset. The study is also important in providing a large weighted census-balanced sample sourced from a well-respected provider that will be publicly released to allow other researchers to uncover new insights and revisit findings addressed herein with a different analytic approach. This will be aided by other transparency measures such as the public release of a pre-registered pre-analysis plan along with all the statistical code, the survey instrumentation, and indeed the dissertation itself.

Effective altruism and its commitment to using empirical methods to “do good better” was a guiding principle for this research. It was approached by isolating the animal protection frame as the mechanism by which effectiveness could be measured, thus aligning the work with a subset of effective altruism known as EAA. This

dissertation adds to knowledge on how social movement organizations can address concerns about industrial animal agriculture—one of effective altruism’s top three priorities—by understanding more about diet modification patterns. This research has built on the work of other EAAs who wish to reduce suffering in the most impactful ways possible. Importantly though, not all EAAs define “doing the most good” using the same metrics. This dissertation has added to an understanding of one such perspective, while acknowledging that the diversity of viewpoints among effective altruists will necessarily mean that others may bring different interpretations to the data. In response, one goal of this work was to allow for transparency in design and dissemination as well as to assert that conclusions should be read considering the specific indicators under study.

This doctoral research informs academic study in the areas of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change. It provides a new way to examine the question of doing the most good in terms of meat consumption using an EAA lens. It explores questions around efficacy and social movement outcomes specific to animal advocates as well as provides insights more generally into how social movements can influence impact for their cause.

The literature on social movement outcomes was discussed in relation to cultural outcomes and how prevalence rates may impact change on this front, as well as frame alignment and its connection to external perceptions. Also addressed was how a segment of the movement can be conceptualized as a lifestyle movement in that many advocates promote dietary modification to foster social change. The biographical domain portion of the literature on social movement outcomes was used to highlight the importance of considering the different lived understandings that meat restrictors have regarding their

diet to appreciate the satisfaction levels of the existing base of adherents. Additionally, the social movement literature was used to warn of the complexities involved in making projections about the far future in general—and social movement success in particular—given that change can affect social movements in unexpected ways.

The dissertation also contributes to an understanding of the sociology of food through findings that speak to the fact that food consumption is woven into our social fabric and in addition to meeting the requirements of the body, food is used to satisfy a host of socially determined needs. The survey results show that far more than nutrition and the need to satisfy hunger determine dietary intentions and maintenance. On this topic, one phenomenon discussed prominently in the dissertation is the potential impact of food opinion leaders, i.e., those who shape others' attitudes and choices around food. Such individuals are thought to be particularly relevant for any discussions about projections for the far future. In the survey, food opinion leaders were found to represent between 5% and 9% of the diet groups under study. Though they account for a small segment of each group, these individuals are a potentially powerful cohort to harness given that the sociology of food tells us that social influences impact the outcome of attempts at dietary change. Thus, food opinion leaders may create a multiplier effect by not only taking on a diet themselves, but inspiring others to do the same. This in turn may make them an especially useful focus for advocates and their dietary outreach at the individual level.

The research also speaks to how perceptions and experiences across various meat-restricted diets can be examined by understanding the levers of behaviour change including dietary intentions, attitudes, perceived behavioural control, and subjective norms. It also demonstrates that the cognitive stages of change (precontemplation,

contemplation, preparation) can be useful to assess readiness to change and the potential for uptake.

6.3 Directions for Future Research

There are several limitations to this study that could be addressed in future research. A major drawback is the discrepancy in diet data for meat reducers, where—when using the transformed FFQ variable—they self-reported eating more daily servings of meat than the U.S. population, omnivores, and those not restricting their meat consumption. Given the importance to advocates of having an indicator that can speak to how dietary patterns drive the movement of farmed animals into and out of the food stream, the hope is that this work can inform future efforts in this area.

This research has made salient the difficulty in using self-reported dietary data to speak to current and projected future animal agricultural trends. However, this study is not alone in taking steps to translate self-reported consumption data (particularly FFQs) into metrics that speak to the impact on farmed animals (Veganuary, 2016), nor is it unique in discovering a host of limitations to this process. One of the conclusions stemming from this dissertation is the weaknesses of using a simple FFQ for such an appraisal. Indeed, although FFQs are often the method of choice for large government and academic studies—particularly those connected to epidemiology and that produce dietary guidelines—they have come under fire most recently by Archer et al., (2015). The researchers call into question the use of “memory-based dietary assessment

methods” which they say are “fundamentally and fatally flawed” (Archer et al., 2015, p. 911).⁶¹

If an FFQ were to be used in future, one option would be to administer an FFQ with the addition of a portion size measure (and possibly a more detailed food list). FFQs that do not collect portion size information are referred to as non-quantitative (McNutt et al., 2008, pp. S24–S25). FFQs that measure portion size are either: 1) semi-quantitative, which specify servings within the food line; or 2) quantitative, which include discrete questions on portion size (McNutt et al., 2008, pp. S24–S25). Quantitative FFQs provide the most robust measurement of portion size and so are best when estimated intakes are required (McNutt et al., 2008, pp. S24–S25).

Some quantitative FFQs ask respondents to estimate whether their consumption is a standard serving size, less than, or more than this amount. Another approach is to specify discrete quantities for each food item (e.g., <1/2 cup, 1/2–1 cup, >1cup) which can be based on existing research such as the Continuing Survey of Food Intakes by Individuals (McNutt et al., 2008, pp. S24–S25). A further option is to provide small, medium, and large categories, where the medium serving is indicated. The danger however is that these terms are likely not to have an accepted meaning (Cade et al., 2002, pp. 570–571). Some FFQ ask about meat consumption in ounces, grams, or pounds (Goldbohm et al., 1994, p. 255; Keating, Bogen, & Chan, 2007, p. 1357; Salvini et al., 1989, pp. 859–860), while other quantitative FFQ provide images of various

⁶¹ There have, however, been responses to this critique, most notably by Subar et al., (2015, p. 1) who put forth a strong recommendation for the continued collection of self-reported dietary intake data because they “contain valuable, rich, and critical information.”

portion sizes to allow respondents to situate their intake, which is an approach recommended by many experts (Cade et al., 2002, pp. 570–571).

There are, however, disadvantages to collecting portion size information for foods such as meats (particularly in mixed dishes) compared to items that have discrete serving sizes e.g., one apple (Brown, 2006, pp. 1541–1542). Additionally, semi-quantitative questionnaires can be cognitively complex for respondents, particularly if their intake does not match the amount specified.

Respondent burden aside, an FFQ that assesses portion sizes could be advantageous in that it allows for a more precise calculation of the number of animals consumed. Using such an approach in future may be able to better identify meat reducers who consume meat with similar regularity as non-reducers, but who eat smaller portions on average. A semi-quantitative or quantitative FFQ could also be used to classify respondents below a certain threshold as meat reducers rather than relying on self-identification with the label. This brings limitations, however, in that it may be overly inclusionary by, for example, counting individuals who have always eaten less meat than the average and do not identify as reducers, which would make it challenging to ask them specific questions about their experiences with their reduced-meat diet.

Assessing usual dietary intake is cognitively complex (Brown, 2006, pp. 1541–1542) and it is made even more so when an FFQ requires that participants “invoke habitual memory of dietary intake over the relevant period and do the arithmetic necessary to estimate average exposure over well-defined periods” (Hebert et al., 1997, p. 1051). Generic memories of dietary intake are thought to supersede more specific ones for assessment periods that take in more than two weeks (Hebert et al., 1997, p. 1051). While specific memory is most evident in a 24-hour recall, generic memory

(which makes use of general impressions of habitual diet) comes into play in FFQs and is thought to be more prone to social approval bias (Miller et al., 2008, p. 2). Thus, future research could instead employ a dietary assessment that uses specific memory (e.g., a 24-hour recall) or does not require memory (e.g., food records), which may be preferable to a FFQ that requires generic memory and that asks respondents to engage in complex recall and averaging. This is a more time consuming and costly endeavour, however, which is why it was not pursued for this research.

The exclusion of sea animals from the analysis on farmed animal impact also carries limitations that could be addressed in future research. Consumption data for fish and shellfish was collected in the survey to allow for the possibility that these figures could be re-run in future. There are concerns about the quality of the data on sea animals, however, given that they are reported by weight rather than per individual as well as the necessity of including “feed” fish and “bycatch,” all of which requires a great deal of assumptions. It is also estimated that approximately 90% of the sea animals consumed in the U.S. are imported (NOAA Fisheries, n.d.), which adds further complications to settling on solid figures. If a solid methodology could be devised—taking in existing efforts to quantify sea animals in the food stream (Animal Charity Evaluators, 2014a; Sethu, 2012)—such an exploration would be worthwhile.

This study is not able to speak directly to the effectiveness of *promoting* a meat reduction or elimination message given that this was not an intervention study. As such, future efforts may be well-served to employ experimental designs to supplement the very small number of existing studies that address the question at hand using causal designs. Additional cross-sectional designs could also focus on devising other variables

and indicators and/or operationalizing the ones used in this study differently to assess how the overarching conclusions may change in response.

Future research could also employ other analytic approaches. Specifically, a theory-based logic of causal order for the variables used in the survey could be used to develop a set of propositions that give the expectation that two or more variables are related. Such associations could be explored analytically and the supporting theory used in turn to help explain the connection (if any). In this way, rather than looking solely at which of the three diets performed the best on a given indicator, a case could be put forth for analyzing how variables of interest predict diet choice or vice versa. In the instance of social ties, an analytic plan could be developed that uses theory to determine whether to hypothesize that diet modification leads individuals to change their social networks or if the nature of one's social ties impacts their dietary choice.

In this vein, there could be an additional treatment of the TPB, which posits that the probability that an individual will engage in a behaviour that is aligned with an attitude is related to how strong their intention is, which can be predicted using attitude toward the behaviour, perceived behavioural control, and subjective norms (Bordens & Horowitz, 2001, pp. 199–200). As Bordens and Horowitz explain, “by measuring these factors, we can determine the strength of intention, which enables us to predict the likelihood of the behavior” (2001, p. 199). Thus, the TPB could be analyzed—beyond simply examining the differences between groups and treating its four items in isolation—by using regression analysis to examine how attitudes, subjective norms, and perceived behavioural control predict dietary intentions. This is an approach that has been used elsewhere concerning meat consumption (Povey et al., 2001, p. 15). Such findings could also be compared to results from a meta-analytic review that showed that

“attitude, subjective norm and [perceived behavioural control] account for significantly more of the variance in individuals’ desires than intentions or self-predictions, but intentions and self-predictions were better predictors of behaviour” (Armitage & Conner, 2001, p. 471).

There are limitations that stem from using an online opt-in nonprobability-based sample with population targets, particularly for making inferences about the distribution of variables in society. Future research could attempt to replicate the results of this study using KnowledgePanel, which is GfK’s probability-based online sample considered to be representative of the U.S. population.

Several other fruitful future research directions were uncovered in the process of discussing and attempting to explain or at least contextualize the results. Existing literature can in many cases speak to external perceptions and internal experiences of vegetarianism, while far less is known on these topics for reduced-meat and chicken-free diets. This study is the first to provide *comparative* data where variables are assessed across the three diets. Future research can help confirm this study’s findings given its novelty and the difficulty of placing it within existing literature. Further research could also add more to the comparative aspect by bringing in additional diets as well as new indicators.

The same diet cannot be said to have both the best external perceptions and internal experiences. While non-restrictors believe they will be most contented on a reduced-meat diet, those who are currently eating a reduced-meat diet are less satisfied than their vegetarian and chicken-avoiding counterparts. One possible explanation is that certain types of individuals are drawn to a vegetarian or chicken-free diet and bring with them a stronger resolve, which separates them and their experiences from non-

restrictors. Under such a scenario, if the prevalence rates for a vegetarian and chicken-free diet increase in future without the help of this “low-hanging fruit,” it may be that the satisfaction rate for vegetarians and chicken avoiders will level off. Exploring this discrepancy and possible explanations would be a productive avenue for future research to help address how advocates should respond, i.e., by making use of non-reducing omnivores’ heightened perceived expectations for meat reduction or by promoting the diet(s) with the better internal experiences.

Future research could also examine whether there are differences in the levels of determination experienced by vegetarians, meat reducers, and chicken avoiders to help explain if this is one of the mechanisms that underpins vegetarians’ better internal experiences. Vegetarians may have spent time *learning* how to be successful on their diet given its higher demands, and being further along on this learning curve may impart more positive feelings. A question ripe for future research is whether the true lived experience is indeed better for vegetarians or if this is a function of skewed perceptions or denial. If the more restrictive diets like vegetarianism (and to an extent chicken avoidance) come with deeply held motivations, particularly ethical ones, this could be clouding out some of the nuisances, whether in practice or at least by limiting individual’s willingness to readily admit to them because the commitment is so strongly cemented. Future research could help add clarity to this topic.

Finally, the finding that meat reducers ranked the lowest on lived experiences is surprising in some ways, especially given the inherent flexibility of the diet. A reduced meat diet does not position its adherents as far outside mainstream society when it comes to eating and its followers come into less conflict with social food norms than more restrictive dietary patterns like vegetarianism. Though meat reducers’ personal

experiences may not be felt as deeply as vegetarians'. Perhaps it is a scenario of the less sacrifice and need to work to overcome the learning curve, the fewer personal rewards. This is another research question that would benefit from future scholarly attention.

6.4 Concluding Summary

Following Voltaire's assertion that the perfect can be the enemy of the good, this research explored whether vegetarianism (the perfect) may be the enemy of the good for realizing advocates' desired social movement outcomes in American society around meat and farmed animals. This dissertation, drawing on applied sociology and positioned at the intersection of effective altruism, social movement outcomes, the sociology of food, and dietary behaviour change, examined this research problem. The findings suggested that there are reasons to infer that a reduced-meat diet may best support an EAA approach to U.S. dietary outreach.

REFERENCES

- Academy of Nutrition and Dietetics. (2016). Position of the academy of nutrition and dietetics: Vegetarian diets. *Journal of the Academy of Nutrition and Dietetics*, 116(12), 1970–1980.
- Adams, C. J. (2004). *The pornography of meat*. New York, NY: Continuum.
- Agresti, A., & Finlay, B. (1999). *Statistical methods for the social sciences* (third edition). Upper Saddle River, NJ: Prentice Hall.
- American Heart Association. (2017). What is a serving? Retrieved from http://www.heart.org/HEARTORG/Support/What-is-a-Serving_UCM_301838_Article.jsp#.WR3a0VIZPdQ
- American Sociological Association. (2015). Sex and gender categories for ASA membership. Retrieved from http://www.asanet.org/sites/default/files/savvy/footnotes/septoct15/sex-gender_0915.html
- Animal Charity Evaluators. (n.d.-a). ACE online ads impact spreadsheet. Retrieved from adsheets/d/1iNDQIt9MRD4r1ws5M_2hQ-MNjMY-bcUra0fpOmF4Am0/edit#gid=0
- Animal Charity Evaluators. (n.d.-b). Faunalytics data analysis method. Retrieved from <https://animalcharityevaluators.org/research/dietary-impacts/vegetarian-recidivism/hrc-data-analysis-method/>
- Animal Charity Evaluators. (n.d.-c). Grant regulations. Retrieved from <http://researchfund.animalcharityevaluators.org/regulations-policies/>
- Animal Charity Evaluators. (2014a). Fish consumption. Retrieved from <https://animalcharityevaluators.org/research/dietary-impacts/fish-consumption/>
- Animal Charity Evaluators. (2014b). Wild animal suffering. Retrieved from <https://animalcharityevaluators.org/approach/prioritizing-causes/wild-animal-suffering/>
- Animal Charity Evaluators. (2016a). Prioritizing causes. Retrieved from <https://animalcharityevaluators.org/approach/prioritizing-causes/>
- Animal Charity Evaluators. (2016b). The effects of diet choices. Retrieved from <https://animalcharityevaluators.org/research/dietary-impacts/effects-of-diet-choices/>
- Animal Charity Evaluators. (2016c). Why farmed animals? Retrieved from <https://animalcharityevaluators.org/donation-advice/why-farmed-animals/>
- Animal Charity Evaluators. (2017). *2016 year in review*. Retrieved from <https://animalcharityevaluators.org/wp-content/uploads/2017/02/ace-2016-year-in-review-rgb.pdf>
- Apovian, C. M., Murphy, M. C., Cullum-Dugan, D., Lin, P.-H., Gilbert, K. M., Coffman, G., ... Moore, T. J. (2010). Validation of a web-based dietary questionnaire designed for the DASH (dietary approaches to stop hypertension) diet: The DASH online questionnaire. *Public Health Nutrition*, 13(5), 615–622.
- Archer, E., Pavea, G., & Lavie, C. J. (2015). The inadmissibility of what we eat in America and NHANES dietary data in nutrition and obesity research and the scientific formulation of national dietary guidelines. *Mayo Clinic Proceedings*, 90(7), 911–926.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A

- meta-analytic review. *British Journal of Social Psychology*, 40, 471–499.
- Asher, K. (2016a). Doctoral dissertation - Is the perfect the enemy of the good? The role of dietary choices, perceptions, and experiences in changing meat consumption patterns in the U.S. Retrieved from osf.io/vhjem
- Asher, K. (2016b). Plant-based distractors in FFQs. Retrieved from <https://osf.io/hracu/>
- Asher, K. (2016c). Pre-registration doctoral dissertation. Retrieved from <https://osf.io/rhfqa/>
- Asher, K., & Cherry, E. (2015). Home is where the food is: Barriers to vegetarianism and veganism in the domestic sphere. *Journal for Critical Animal Studies*, 13(1), 66–91.
- Asher, K., Green, C., DeLespinasse, C., Gutbrod, H., Bastian, B., Jewell, M., & Hale, G. (2015). *Study of current and former vegetarians and vegans: Qualitative findings*. Olympia, WA. Retrieved from <https://faunalytics.org/wp-content/uploads/2015/07/Faunalytics-Study-of-Current-and-Former-Vegetarians-and-Vegans—Qualitative-Findings1.pdf>
- Asher, K., Green, C., Gutbrod, H., Jewell, M., Hale, G., & Bastian, B. (2014a). *Study of current and former vegetarians and vegans: Companion to the initial findings*. Olympia, WA. Retrieved from https://faunalytics.org/wp-content/uploads/2015/06/Faunalytics_Current-Former-Vegetarians_Tables-Methodology.pdf
- Asher, K., Green, C., Gutbrod, H., Jewell, M., Hale, G., & Bastian, B. (2014b). *Study of current and former vegetarians and vegans: Initial findings*. Olympia, WA. Retrieved from https://faunalytics.org/wp-content/uploads/2015/06/Faunalytics_Current-Former-Vegetarians_Full-Report.pdf
- Asher, K., Green, C., Peake, C., Jewell, M., Gutbrod, H., Hale, G., & Bastian, B. (2016). *Study of current and former vegetarians and vegans: Secondary findings*. Olympia, WA. Retrieved from <https://faunalytics.org/wp-content/uploads/2016/02/Faunalytics-Study-of-Current-and-Former-Vegetarians-and-Vegans—Secondary-Findings-.pdf>
- Baker, R., Blumberg, S. J., Brick, J. M., Couper, M. P., Courtright, M., Dennis, J. M., ... Zahs, D. (2010). Research synthesis: aapor report on online panels. *Public Opinion Quarterly*, 74(4), 711–781.
- Ball, M. (2015a). It would be so amazing if everyone would stop engaging in internecine debates. Retrieved from <http://www.mattball.org/2015/12/it-would-be-so-amazing.html>
- Ball, M. (2015b). *University of Arizona MBA marketing tearch to teduce farm animal suffering*. Retrieved from <http://www.onestepmatters.com/wp-content/uploads/2015/12/UofAZFarmAnimalMarketingResearchMay2015.pdf>
- Baur, G. (2008). *Farm sanctuary: Changing hearts and minds about animals and food*. New York, NY: Simon & Schuster.
- Beardsworth, A., & Keil, T. (1992). The vegetarian option: Varieties, conversions, motives and careers. *The Sociological Review*, 40(2), 253–293.
- Beardsworth, A., & Keil, T. (1997). *Sociology on the menu: An invitation to the study of food and society*. London, UK: Routledge.
- Berinsky, A. J., Margolis, M. F., & Sances, M. W. (2014). Separating the shirkers from the workers? Making sure respondents pay attention on self-administered surveys. *American Journal of Political Science*, 58(3), 739–753.

- Berndsen, M., & van der Pligt, J. (2004). Ambivalence towards meat. *Appetite*, 42(1), 71–8.
- Bertrandias, L., & Goldsmith, R. E. (2006). Some psychological motivations for fashion opinion leadership and fashion opinion seeking. *Journal of Fashion Marketing and Management*, 10(1), 25–40.
- Biemer, P. P., & Christ, S. L. (2008). Weighting survey data. In E. D. de Leeuw, J. J. Hox, & D. A. Dillman (Eds.), *International handbook of survey methodology* (pp. 317–341). New York, NY: Psychology Press.
- Bockman, J. (2015). *Animal Charity Evaluators*. (R. Carey, Ed.), *The effective altruism handbook*. Oxford, UK: Centre For Effective Altruism. Retrieved from http://careyryan.com/files/EA_Handbook.pdf
- Bono, C., Cornou, C., Lundbye-Christensen, S., & Ringgaard Kristensen, A. (2014). Dynamic production monitoring in pig herds III. Modeling and monitoring mortality rate at herd level. *Livestock Science*, 168, 128–138.
- Bordens, K. S., & Horowitz, I. A. (2001). *Social psychology* (second edition). Mahwah, N.J.: Lawrence Erlbaum Associates.
- Bosi, L., & Uba, K. (2009). Introduction: The outcomes of social movements. *Mobilization: An International Quarterly*, 14(4), 409–415.
- Bouvard, V., Loomis, D., Guyton, K. Z., Grosse, Y., Ghissassi, F. El, Benbrahim-Tallaa, L., ... International Agency for Research on Cancer Monograph Working Group. (2015). Carcinogenicity of consumption of red and processed meat. *The Lancet Oncology*, 16(16), 1599–1600.
- Boyle, J. E. (2011). Becoming vegetarian: The eating patterns and accounts of newly practicing vegetarians. *Food and Foodways*, 19(4), 314–333.
- Brancato, G., Macchia, M., Murgia, M., Signore, M., Simeoni, G., Blanke, K., ... Hoffmeyer-Zlotnik, J. H. P. (2006). *Handbook of recommended practices for questionnaire development and testing in the European Statistical System*. Retrieved from http://ec.europa.eu/eurostat/ramon/statmanuals/files/Handbook_of_Practices_for_Quest.pdf
- Bridle, C., Riemsma, R. P., Pattenden, J., Sowden, A. J., Mather, L., Watt, I. S., & Walker, A. (2005). Systematic review of the effectiveness of health behavior interventions based on the transtheoretical model. *Psychology & Health*, 20(3), 283–301.
- Brown, D. (2006). Do food frequency questionnaires have too many limitations? *Journal of the American Dietetic Association*, 106(10), 1541–1542.
- Bryman, A. (2002). *Social research methods* (fourth edition). Oxford, UK: Oxford University Press.
- Burger, J. M. (1999). The foot-in-the-door compliance procedure: A multiple-process analysis and review. *Personality and Social Psychology Review*, 3(4), 303–325.
- Cade, J., Thompson, R., Burley, V., & Warm, D. (2002). Development, validation and utilisation of food-frequency questionnaires – a review. *Public Health Nutrition*, 5(4), 567–587.
- Caldwell, K. (2017). Which call to action should we use in pro-vegetarian videos? Retrieved from <http://www.mercyforanimals.org/which-call-to-action-should-we-use-in-pro>
- Canadian Institutes of Health Research, Natural Sciences and Engineering Research

- Council of Canada, & Social Sciences and Humanities Research Council of Canada. (2014). *TCPS2 2-14. Tri-Council policy statement: Ethical conduct for research involving humans*. Ottawa, ON. Retrieved from http://www.pre.ethics.gc.ca/pdf/eng/tcps2-2014/TCPS_2_FINAL_Web.pdf
- Cherry, E. (2003). *"It's not just a diet": Identity, commitment, and social networks in vegans*. The University of Georgia. Retrieved from <http://athenaeum.libs.uga.edu/handle/10724/7081>
- Cherry, E. (2006). Veganism as a cultural movement: A relational approach. *Social Movement Studies*, 5(2), 155–170.
- Cherry, E. (2015). I was a teenage vegan: Motivation and maintenance of lifestyle movements. *Sociological Inquiry*, 85(1), 55–74.
- Cherry, E. (2016). *Culture and activism: Animal rights in France and the United States*. New York, NY: Ashgate Publishing.
- Chin, M. G., Fisak, B., & Sims, V. K. (2002). Development of the attitudes toward vegetarians scale. *Anthrozoös*, 15(4), 332–342.
- Chiu, T. H. T., & Lin, C.-L. (2009). Ethical management of food systems: Plant based diet as a holistic approach. *Asia Pacific Journal of Clinical Nutrition*, 18(4), 647–653.
- Christensen, G. (2016). *Manual of best practices in transparent social science research*. Berkeley, CA. Retrieved from <http://www.bitss.org/education/manual-of-best-practices/>
- Christian, L. M., Parsons, N. L., & Dillman, D. a. (2009). Designing scalar questions for web surveys. *Sociological Methods & Research*, 37(3), 393–425.
- Cole, M., & Morgan, K. (2011). Vegaphobia: Derogatory discourses of veganism and the reproduction of speciesism in UK national newspapers. *The British Journal of Sociology*, 62(1), 134–153.
- Cooney, N. (2011). *Change of heart: What psychology can teach us about spreading social change*. Brooklyn, NY: Lantern Books.
- Cooney, N. (2014). *Veganomics: The surprising science on what motivates vegetarians, from the breakfast table to the bedroom*. Brooklyn, NY: Lantern Books.
- Craig, W. J., & Mangels, A. R. (2009). Position of the American Dietetic Association: Vegetarian diets. *Journal of the American Dietetic Association*, 109(7), 1266–1282.
- Cron, J., & Pobocik, R. (2013). Intentions to continue vegetarian dietary patterns: An application of the theory of planned behavior. *Journal of the Academy of Nutrition and Dietetics*, 113(9), A90.
- Dasgupta, S., & Driskell, R. (2007). *Discourse on applied sociology: Theoretical perspectives*. London, UK: Anthem Press.
- Davis, K. (2015). Is chicken healthier than red meat? Retrieved from <http://www.opednews.com/articles/Is-Chicken-Healthier-Than-by-Karen-Davis-Diet-And-Health-151107-679.html>
- DeMello, M. (2012). *Animals and society: An introduction to human-animal studies*. New York, NY: Columbia University Press.
- Di Noia, J., & Prochaska, J. O. (2010). Dietary stages of change and decisional balance: A meta-analytic review. *American Journal of Health Behavior*, 34(5), 618–632.
- DiClemente, C. C., & Prochaska, J. O. (1982). Self-change and therapy change of smoking behavior: A comparison of processes of change in cessation and maintenance. *Addictive Behaviors*, 7(2), 133–142.

- Dillard, J. (2008). A slaughterhouse nightmare: Psychological harm suffered by slaughterhouse employees and the possibility of redress through legal reform. *Georgetown Journal on Poverty Law & Policy*, *XV*(2), 391–408.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (fourth edition). Hoboken, NJ: John Wiley & Sons, Inc.
- Direct Action Everywhere. (n.d.). FAQ. Retrieved from <http://www.directactioneverywhere.com/faq/>
- Doebel, S., Gabriel, S., & The Humane League. (2015). *Report: Does encouraging the public to “eat vegan,” “eat vegetarian,” “eat less meat,” or “cut out or cut back on” meat and other animal products lead to the most diet change?* Retrieved from <http://www.humaneleaguelabs.org/static/reports/2015/09/humane-league-labs-best-request2.pdf>
- Doidge, J. C., & Segal, L. (2012). Most australians do not meet recommendations for dairy consumption: Findings of a new technique to analyse nutrition surveys. *Australian and New Zealand Journal of Public Health*, *36*(3), 236–240.
- Dunayer, J. (2004). *Speciesism*. Derwood, MD: Ryce Publishing.
- Edwards, S. (2013). Living in a minority food culture: A phenomenological investigation of being vegetarian/vegan. *Phenomenology & Practice*, *7*(1), 111–125.
- Effective Animal Advocacy – discussion Facebook group. (n.d.).
- Einwohner, R. L. (1999). Gender, class, and social movement outcomes: Identities and effectiveness in two animal rights campaigns. *Gender & Society*, *13*(1), 56–76.
- Einwohner, R. L. (2001). Protester/target interactions: A microsociological approach to studying movement outcomes. In P. G. Coy (Ed.), *Political opportunities, social movements, and democratization* (pp. 207–223). Oxford, UK: Elsevier Science Ltd.
- Eshel, G., Martin, P. A., & Bowen, E. E. (2010). Land use and reactive nitrogen discharge: Effects of dietary choices. *Earth Interactions*, *14*(21), 1–15.
- Eshel, G., Shepon, A., Makov, T., & Milo, R. (2014). Land, irrigation water, greenhouse gas, and reactive nitrogen burdens of meat, eggs, and dairy production in the United States. *Proceedings of the National Academy of Sciences*, *111*(33), 11996–12001.
- ESOMAR. (n.d.). Directory of research. Retrieved from <https://directory.esomar.org>
- ESOMAR. (2012). *28 questions to help buyers of online samples*. Retrieved from <https://www.esomar.org/uploads/public/knowledge-and-standards/documents/ESOMAR-28-Questions-to-Help-Buyers-of-Online-Samples-September-2012.pdf>
- Falomir, Z., Arregui, M., Madueño, F., Corella, D., & Coltell, Ó. (2012). Automation of food questionnaires in medical studies: A state-of-the-art review and future prospects. *Computers in Biology and Medicine*, *42*(10), 964–974.
- Farm Forward. (n.d.). Ending factory farming. Retrieved from <https://farmforward.com/ending-factory-farming/>
- Faunalytics. (2007). *Advocating meat reduction and vegetarianism to adults in the U.S.* Olympia, WA. Retrieved from <https://faunalytics.org/wp-content/uploads/2016/02/HRC-Veg-Study-2007-Full-Report-HRC-MASTER.pdf>
- Faunalytics. (2010). *How many vegetarians are there?* Olympia, WA. Retrieved from https://faunalytics.org/wp-content/uploads/2015/05/Fundamentals_How-Many-Vegetarians.pdf

- Faunalytics. (2016). Survey instrument. Study of current and former vegetarians and vegans. Retrieved from <https://faunalytics.org/dataset-study-of-current-and-former-vegetarians-and-vegans/>
- Fehrenbach, K. S. (2015). *Designing messages to reduce meat consumption: A test of the extended parallel process model*. Arizona State University.
<https://doi.org/10.1017/CBO9781107415324.004>
- Fehrenbach, K. S., Richter, A. C., & Santo, R. E. (2016). A critical examination of the available data sources for estimating meat and protein consumption in the USA. *Public Health Nutrition*, 19(8), 1358–1367.
- Field, A. (2009). *Discovering statistics using SPSS* (third edition). Los Angeles, CA: SAGE Publications, Inc.
- Finsen, L., & Finsen, S. (1994). *The animal rights movement in America: From compassion to respect*. New York, NY: Twayne Publishers.
- Fischer, B., & McWilliams, J. (2015, August 16). When vegans won't compromise. *The New York Times*. Retrieved from <https://opinionator.blogs.nytimes.com/2015/08/16/when-vegans-wont-compromise/>
- Flynn, L. R., Goldsmith, R. E., & Eastman, J. K. (1996). Opinion leaders and opinion seekers: Two new measurement scales. *Journal of the Academy of Marketing Science*, 24(2), 137–147.
- Food and Agriculture Organization of the United Nations. (2006). *Livestock's long shadow: Environmental issues and options*. Rome, Italy.
<https://doi.org/10.1007/s10666-008-9149-3>
- Food Marketing Institute. (2015). *U.S. grocery shopper trends 2015 executive summary*. Retrieved from <http://www.fmi.org/docs/default-source/document-share/fmitrends15-exec-summ-06-02-15.pdf?sfvrsn=2>
- Fox, N., & Ward, K. (2008). Health, ethics and environment: A qualitative study of vegetarian motivations. *Appetite*, 50(2–3), 422–429.
- Francione, G. L. (2015). A thought about “reducetarianism.” Retrieved from <https://www.facebook.com/abolitionistapproach/posts/1076506842369069>
- Fried, B. H. (2015). Not-so-ordinary altruism: A defense of effective altruism raises the question of just how effective that movement can be. Retrieved from https://ssir.org/book_reviews/entry/not_so_ordinary_altruism
- Germov, J., & Williams, L. (2008a). *A sociology of food & nutrition: The social appetite* (third edition). Oxford, UK: Oxford University Press.
- Germov, J., & Williams, L. (2008b). Exploring the social appetite: A sociology of food and nutrition. In J. Germov & L. Williams (Eds.), *A sociology of food & nutrition: The social appetite* (third edition, pp. 3–23). Oxford, UK: Oxford University Press.
- Giugni, M. G. (1998). Was it worth the effort? The outcomes and consequences of social movements. *Annual Review of Sociology*, 98, 371–393.
- Gnambs, T., & Batinic, B. (2011). Convergent and discriminant validity of opinion leadership. *Journal of Individual Differences*, 32(2), 94–102.
- Goldbohm, R. A., van den Brandt, P. A., Brants, H. A. M., van't Veer, P., Al, M., Sturmans, F., & Hermus, R. J. J. (1994). Validation of a dietary questionnaire used in a large-scale prospective study on diet and cancer. *European Journal of Clinical Nutrition*, 48(4), 253–265.
- Goldsmith, R. E., & Clark, R. A. (2008). An analysis of factors affecting fashion opinion leadership and fashion opinion seeking. *Journal of Fashion Marketing and*

- Management*, 12(3), 308–322.
- Goodland, R., & Anhang, J. (2009). *Livestock and climate change: What if the key actors in climate change are cows, pigs, and chickens?* Retrieved from <http://www.worldwatch.org/node/6294>
- Google Trends. (n.d.). “vegan” “vegetarian” comparison.
- Google Trends. (2017). “vegetarian” “vegan.” Retrieved from <https://trends.google.com/trends/explore?date=all&geo=US&q=%22vegetarian%22%22vegan%22>
- Göritz, A. S. (2006). Incentives in web studies: Methodological issues and a review. *International Journal of Internet Science*, 1(1), 58–70. Retrieved from http://www.ijis.net/ijis1_1/ijis1_1_goeritz.pdf
- Gottliebson, D., Layton, N., & Wilson, E. (2010). Comparative effectiveness report: Online survey tools. *Disability and Rehabilitation. Assistive Technology*, 5(6), 401–410.
- Greenebaum, J. (2012a). Managing impressions: “Face-saving” strategies of vegetarians and vegans. *Humanity & Society*, 36(4), 309–325.
- Greenebaum, J. (2012b). Veganism, identity and the quest for authenticity. *Food, Culture & Society*, 15(1), 129–144.
- Greenland, S., Senn, S. J., Rothman, K. J., Carlin, J. B., Poole, C., Goodman, S. N., & Altman, D. G. (2016). Statistical tests, p values, confidence intervals, and power: A guide to misinterpretations. *European Journal of Epidemiology*, 31(4), 337–350.
- Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). *Survey methodology* (second edition). Hoboken, NJ: John Wiley & Sons.
- Grunert, K. G., Dean, M., Raats, M. M., Nielsen, N. A., & Lumbers, M. (2007). A measure of satisfaction with food-related life. *Appetite*, 49(2), 486–493.
- Haddad, E. H., & Tanzman, J. S. (2003). What do vegetarians in the United States eat? *The American Journal of Clinical Nutrition*, 78(suppl), 626S–632S.
- Haenfler, R., Johnson, B., & Jones, E. (2012). Lifestyle movements: Exploring the intersection of lifestyle and social movements. *Social Movement Studies*, 11(1), 1–20.
- Harkness, J. A. (2008). Comparative survey research: Goals and challenges. In E. D. de Leeuw, J. J. Hox, & D. A. Dillman (Eds.), *International handbook of survey methodology* (pp. 56–77). New York, NY: Psychology Press.
- Hatkoff, A. (2009). *The inner world of farm animals: Their amazing social, emotional, and intellectual capacities*. New York, NY: Stewart, Tabori and Chang.
- Haverstock, K., & Forgays, D. K. (2012). To eat or not to eat. A comparison of current and former animal product limiters. *Appetite*, 58(3), 1030–1036.
- Hebert, J. R., Ma, Y., Clemow, L., Ockene, I. S., Saperia, G., Stanek, E. J., ... Ockene, J. K. (1997). Gender differences in social desirability and social approval bias in dietary self-report. *American Journal of Epidemiology*, 146(12), 1046–1055.
- Hirschler, C. a. (2011). “What pushed me over the edge was a deer hunter”: Being vegan in North America. *Society & Animals*, 19(2), 156–174.
- Hoaglin, D. C., & Iglewicz, B. (1987). Fine-tuning some resistant rules for outlier labeling. *Journal of the American Statistical Association*, 82(400), 1147–1149.
- Hoonakker, P., & Carayon, P. (2009). Questionnaire survey nonresponse: A comparison of postal mail and Internet surveys. *International Journal of Human-Computer*

- Interaction*, 25(5), 348–373.
- Human Rights Watch. (2004). *Blood, sweat, and fear: Workers' rights in U.S. meat and poultry plants*. New York, NY. Retrieved from <http://www.hrw.org/sites/default/files/reports/usa0105.pdf>
- Humane League Labs. (2014). Diet change and demographic characteristics of vegans, vegetarians, semi-vegetarians, and omnivores. Retrieved from <http://www.humaneleaguelabs.org/static/reports/2014/04/diet-change-and-demographic-characteristics1.pdf>
- Hurford, P., & Anthis, J. (n.d.). Do we need to disguise veg surveys? Retrieved from <https://impactresearch.hackpad.com/Do-We-Need-to-Disguise-Veg-Surveys-2vYsKIeEHLU>
- IBM. (n.d.-a). Rim weighting. Retrieved from http://www.ibm.com/support/knowledgecenter/SSLVQG_7.0.0/com.spss.ddl/weight_rim.htm
- IBM. (n.d.-b). Rim weighting formulae. Retrieved from https://www.ibm.com/support/knowledgecenter/en/SSLVQG_6.0.1/com.spss.ddl/weight_report_formulae.htm
- Ipsos MORI. (2014). Perceptions are not reality: Things the world gets wrong. Retrieved from <https://www.ipsos-mori.com/researchpublications/researcharchive/3466/Perceptions-are-not-reality-Things-the-world-gets-wrong.aspx>
- Jabs, J., Devine, C. M., & Sobal, J. (1998). Maintaining vegetarian diets: Personal factors, social networks and environmental resources. *Canadian Journal of Dietetic Practice and Research*, 59(4), 183–189.
- Jabs, J., Sobal, J., & Devine, C. M. (2000). Managing vegetarianism: Identities, norms and interactions. *Ecology of Food and Nutrition*, 39(5), 375–394.
- Jackson, S. L. (2010). *Statistics plain and simple* (second edition). Belmont, CA: Wadsworth, Cengage Learning.
- Joy, M. (2010). *Why we love dogs, eat pigs, and wear cows: An introduction to carnism*. San Francisco, CA: Conari Press.
- Joy, M. (2013). Speaking truth to power: Understanding the dominant, animal-eating narrative for vegan empowerment and social transformation. Retrieved from <http://www.onegreenplanet.org/animalsandnature/speaking-truth-to-power-understanding-the-dominant-animal-eating-narrative-for-vegan-empowerment-and-social-transformation/>
- Juan, W., Yamini, S., & Britten, P. (2015). Food intake patterns of self-identified vegetarians among the U.S. population, 2007-2010. *Procedia Food Science*, 4, 86–93.
- Katz, E., & Lazarsfeld, P. F. (1955). *Personal influence*. New York, NY: Free Press.
- Keating, G. A., Bogen, K. T., & Chan, J. M. (2007). Development of a meat frequency questionnaire for use in diet and cancer studies. *Journal of the American Dietetic Association*, 107(8), 1356–1362.
- Kushi, L. H., Doyle, C., McCullough, M., Rock, C. L., Demark-Wahnefried, W., Bandera, E. V., ... The American Cancer Society 2010 Nutrition and Physical Activity Guidelines Advisory Committee. (2012). American Cancer Society guidelines on nutrition and physical activity for cancer prevention: Reducing the risk of cancer with healthy food choices and physical activity. *CA: A Cancer*

- Journal for Clinicians*, 62, 30–67.
- Lea, E. J., Crawford, D., & Worsley, A. (2006a). Consumers' readiness to eat a plant-based diet. *European Journal of Clinical Nutrition*, 60(3), 342–351.
- Lea, E. J., Crawford, D., & Worsley, A. (2006b). Public views of the benefits and barriers to the consumption of a plant-based diet. *European Journal of Clinical Nutrition*, 60(7), 828–37.
- Lea, E. J., & Worsley, A. (2001). Influences on meat consumption in Australia. *Appetite*, 36(2), 127–36.
- Leenaert, T. (2015a). How to veganize the world: One possible strategy. Retrieved from <http://veganstrategist.org/2015/09/29/how-to-veganize-the-world/>
- Leenaert, T. (2015b). The narcissism of small differences. Retrieved from <http://veganstrategist.org/2015/11/30/the-narcissism-of-small-differences/>
- Leenaert, T. (2015c). “Vegan is a distraction”. An interview with Matt Ball. Retrieved from <http://veganstrategist.org/2015/11/23/an-interview-with-matt-ball/>
- Leenaert, T. (2015d). Yes, we can ask for less than “go vegan.” Retrieved from <http://veganstrategist.org/2015/10/15/yes-we-can-ask-for-less-than-go-vegan/>
- Leenaert, T. (2016). Do 2 semi-vegans make 1 vegan? Retrieved from <http://veganstrategist.org/2016/05/30/do-2-semi-vegans-make-1-vegan/>
- Leenaert, T. (2017). *How to create a vegan world: A pragmatic approach*. Brooklyn, NY: Lantern Books.
- Lewis, S. (1994). An opinion on the global impact of meat consumption. *American Journal of Clinical Nutrition*, 59(5), 1099S–1102S.
- MacAskill, W. (2015). *What is effective altruism?* (R. Carey, Ed.), *The effective altruism handbook*. Oxford, UK: Centre For Effective Altruism. Retrieved from http://careyryan.com/files/EA_Handbook.pdf
- MacClellan, J. (2013). Size matters: Animal size, contributory causation, and ethical vegetarianism. *Journal of Animal Ethics*, 3(1), 57–68.
- Macdonald, B. N. J., Caldwell, K. D., & Boese, G. D. (2016). *The effects of “reduce” and “eliminate” appeals on individual meat consumption*. Retrieved from <https://mfr.osf.io/render?url=https://osf.io/nrx3/?action=download%26mode=render>
- MacInnis, C. C., & Hodson, G. (2012). Intergroup bias toward “group x”: Evidence of prejudice, dehumanization, avoidance, and discrimination against asexuals. *Group Processes & Intergroup Relations*, 15(6), 725–743.
- MacInnis, C. C., & Hodson, G. (2015). It ain't easy eating greens: Evidence of bias toward vegetarians and vegans from both source and target. *Group Processes & Intergroup Relations*, 1–24.
- Manfreda, K. L., & Vehovar, V. (2008). Internet surveys. In E. D. de Leeuw, J. J. Hox, & D. A. Dillman (Eds.), *International handbook of survey methodology* (pp. 264–284). New York, NY: Psychology Press.
- Mann, C. J. (2003). Observational research methods. Research design II: Cohort, cross sectional, and case-control studies. *Emergency Medicine Journal*, 20(1), 54–60.
- Marlow, H. J., Hayes, W. K., Soret, S., Carter, R. L., Schwab, E. R., & Sabaté, J. (2009). Diet and the environment: Does what you eat matter? *American Journal of Clinical Nutrition*, 89(suppl), 1699S–703S.
- Matthews, D. (2015). You have \$8 billion. You want to do as much good as possible. What do you do? Retrieved from

- <http://www.vox.com/2015/4/24/8457895/givewell-open-philanthropy-charity>
- McAdam, D. (1994). Culture and social movements. In E. Laraña, H. Johnston, & J. R. Gusfield (Eds.), *New social movements: From ideology to identity* (pp. 36–57). Philadelphia, PA: Temple University Press.
- McCormack, F., & O'Reilly, A. (2016). Reducetarians, new welfarists, abolitionists: Do we all want the same thing? Retrieved from <http://www.ecorazzi.com/2016/05/18/reducetarians-new-welfarists-abolitionists-do-we-all-want-the-same-thing/>
- McDonald, B. (2000). “Once you know something, you can’t not know it”: An empirical look at becoming vegan. *Society & Animals*, 8(1), 1–23.
- McNutt, S., Zimmerman, T. P., & Hull, S. G. (2008). Development of food composition databases for food frequency questionnaires (FFQ). *Journal of Food Composition and Analysis*, 21, S20–S26.
- Mennell, S. (2008). Culinary cultures of europe: Food, history, health and identity. In J. Germov & L. Williams (Eds.), *A sociology of food & nutrition: The social appetite* (third edition, pp. 245–263). Oxford, UK: Oxford University Press.
- Mercy for Animals. (n.d.). The “V” word: A note on terminology and strategy. Retrieved from <http://www.mercyforanimals.org/v-word>
- Messina, G. (2011). Bad news for red meat is bad news for chickens. Retrieved from <http://www.theveganrd.com/2011/08/bad-news-for-red-meat-is-bad-news-for-chickens.html>
- Miller, T. M., Abdel-Maksoud, M. F., Crane, L. a, Marcus, A. C., & Byers, T. E. (2008). Effects of social approval bias on self-reported fruit and vegetable consumption: A randomized controlled trial. *Nutrition Journal*, 7(1), 1–7.
- Mintel. (2013). *Meat alternatives - US - June 2013*. Retrieved from <http://store.mintel.com/meat-alternatives-us-june-2013>
- Molag, M. L., de Vries, J. H. M., Ocké, M. C., Dagnelie, P. C., van den Brandt, P. A., Jansen, M. C. J. F., ... van't Veer, P. (2007). Design characteristics of food frequency questionnaires in relation to their validity. *American Journal of Epidemiology*, 166(12), 1468–1478.
- Moussaieff Masson, J. (2003). *The pig who sang to the moon: The emotional world of farm animals*. New York, NY: Ballantine Books.
- Muehlhauser, L. (2015). *Four focus areas of effective altruism*. (R. Carey, Ed.), *The effective altruism handbook*. Oxford, UK: Centre For Effective Altruism. Retrieved from http://careyryan.com/files/EA_Handbook.pdf
- Murcott, A. (1995). Social influences on food choice and dietary change: A sociological attitude. *The Proceedings of the Nutrition Society*, 54(3), 729–735.
- National Cancer Institute. (n.d.). Screeners at a glance. Retrieved from <https://dietassessmentprimer.cancer.gov/profiles/screeners/>
- National Chicken Council. (n.d.). Per capita consumption of poultry and livestock, 1965 to estimated 2016, in pounds. Retrieved from <http://www.nationalchickencouncil.org/about-the-industry/statistics/per-capita-consumption-of-poultry-and-livestock-1965-to-estimated-2012-in-pounds/>
- Nibert, D. (2002). *Animal rights/human rights: Entanglements of oppression and liberation*. Lanham, MD: Rowman & Littlefield Publishers, Inc.
- Nielsen. (n.d.-a). Evaluating weight reports & adjusting targets.
- Nielsen. (n.d.-b). Introduction to weighting.

- Nielsen. (2016). Panelist privacy FAQs. Retrieved from <https://www.nielsen.com/us/en/privacy-statement/privacy-faqs.html>
- NOAA Fisheries. (n.d.). Wild-caught FAQs. Retrieved from <http://www.fishwatch.gov/sustainable-seafood/faqs>
- Norwood, F. B., & Lusk, J. L. (2011). *Compassion, by the pound: The economics of farm animal welfare*. Oxford, UK: Oxford University Press.
- NutritionQuest. (n.d.-a). Meat questionnaire. Retrieved from http://www.nutritionquest.com/products/LLNL_Meat_FFQ_2005.pdf
- NutritionQuest. (n.d.-b). More information about assessment tools. Retrieved from <http://nutritionquest.com/assessment/assessment-methods>
- One Step for Animals. (n.d.-a). One step for animals. Retrieved from <http://onestepforanimals.com>
- One Step for Animals. (n.d.-b). Why one step? Retrieved from <http://www.onestepforanimals.org/why-one-step.html>
- Oxfam America. (2015). *Lives on the line: The human cost of cheap chicken*. <https://doi.org/10.3898/136266210792307069>
- Paisley, J., Beanlands, H., Goldman, J., Evers, S., & Chappell, J. (2008). Dietary change: What are the responses and roles of significant others? *Journal of Nutrition Education and Behavior*, 40(2), 80–88.
- Pasek, J. (2016). When will nonprobability surveys mirror probability surveys? Considering types of inference and weighting strategies as criteria for correspondence. *International Journal of Public Opinion Research*, 28(2), 269–291.
- People for the Ethical Treatment of Animals. (n.d.). PETA's "in vitro" chicken contest. Retrieved from <http://www.peta.org/features/vitro-meat-contest/>
- People for the Ethical Treatment of Animals. (2001). "Eat the whales," say protesters. Retrieved from <http://web.archive.org/web/20020206054949/www.peta-online.org/news/NewsItem.asp?id=246>
- Pew Research Centre. (2014). How Americans feel about religious groups. Retrieved from <http://www.pewforum.org/2014/07/16/how-americans-feel-about-religious-groups/>
- Piazza, J., Ruby, M. B., Loughnan, S., Luong, M., Kulik, J., Watkins, H. M., & Seigerman, M. (2015). Rationalizing meat consumption. The 4Ns. *Appetite*, 91, 114–128.
- Pimentel, D., & Pimentel, M. (2003). Sustainability of meat-based and plant-based diets and the environment. *The American Journal of Clinical Nutrition*, 78(suppl), 660S–663S.
- Pollard, T. M., Steptoe, A., & Wardle, J. (1998). Motives underlying healthy eating: Using the food choice questionnaire to explain variation in dietary intake. *Journal of Biosocial Science*, 30(2), 165–179.
- Povey, R., Conner, M., Sparks, P., James, R., & Shepherd, R. (1999). A critical examination of the application of the transtheoretical model's stages of change to dietary behaviours. *Health Education Research*, 14(5), 641–651.
- Povey, R., Wellens, B., & Conner, M. (2001). Attitudes towards following meat, vegetarian and vegan diets: An examination of the role of ambivalence. *Appetite*, 37(1), 15–26.
- Pribis, P., Pencak, R. C., & Grajales, T. (2010). Beliefs and attitudes toward vegetarian

- lifestyle across generations. *Nutrients*, 2(5), 523–531.
- Prince, M. (1998). The cross-sectional survey. *International Review of Psychiatry*, 10(4), 272–277.
- Puleston, J. (2011). Improving online surveys. *International Journal of Market Research*, 53(4), 557–560.
- Rässler, S., Rubin, D. B., & Schenker, N. (2008). Incomplete data: Diagnosis, imputation, and estimation. In E. D. de Leeuw, J. J. Hox, & D. A. Dillman (Eds.), *International handbook of survey methodology* (pp. 370–386). New York, NY: Psychology Press.
- Regan, T. (1983). *The case for animal rights*. Berkeley, CA: University of California Press.
- Reijnders, L., & Soret, S. (2003). Quantification of the environmental impact of different dietary protein choices. *American Journal of Clinical Nutrition*, 78(suppl), 664S–668S.
- Robbins, J. (2001). *The food revolution: How your diet can help save your life and our world*. Berkeley, CA: Conari Press.
- Rogers, E. M. (2003). *Diffusion of innovations* (fifth edition). New York, NY: Free Press.
- Rogers, E. M., & Cartano, D. G. (1962). Methods of measuring opinion leadership. *The Public Opinion Quarterly*, 26(3), 435–441.
- Roth, L. K. (2005). “Beef. It’s what’s for dinner”: Vegetarians, meat-eaters and the negotiation of familial relationships. *Food, Culture & Society*, 8(2), 181–200.
- Rouse, S. V. (2015). A reliability analysis of Mechanical Turk data. *Computers in Human Behavior*, 43, 304–307.
- Ruby, M. B. (2012). Vegetarianism. A blossoming field of study. *Appetite*, 58(1), 141–50.
- Ruby, M. B., & Heine, S. J. (2011). Meat, morals, and masculinity. *Appetite*, 56(2), 447–450.
- Safran Foer, J. (2009). *Eating animals*. New York, NY: Little, Brown and Company.
- Sagarin, B. J. (2007). Door-in-the-face technique. In R. F. Baumeister & K. D. Vohs (Eds.), *Encyclopedia of social psychology* (pp. 262–263). Thousand Oaks, CA: SAGE Publications, Inc.
- Salvini, S., Hunter, D. J., Sampson, L., Stampfer, M. J., Colditz, G. A., Rosner, B., & Willett, W. C. (1989). Food-based validation of a dietary questionnaire: The effects of week-to-week variation in food consumption. *International Journal of Epidemiology*, 18(4), 858–867.
- Satya. (2004). What would Henry do? Pushing the peanut forward: The satya interview with Henry Spira, 1995. Retrieved from <http://www.satyamag.com/mar04/spira2.html>
- Schnabelrauch Arndt, C. A. (2016). *Tailoring feedback and messages to encourage meat consumption reduction*. Kansas State University. Retrieved from <http://krex.k-state.edu/dspace/bitstream/handle/2097/32159/ChelseaSchnabelrauchArndt2016.pdf?sequence=1&isAllowed=y>
- Schnettler, B., Denegri, M., Miranda, H., Sepúlveda, J., Orellana, L., Paiva, G., & Grunert, K. G. (2014). *Family support and subjective well-being: An exploratory study of university students in Southern Chile*. *Social Indicators Research* (Vol. 122).

- Schnettler, B., Orellana, L., Lobos, G., Miranda, H., Sepúlveda, J., Etchebarne, S., ... Grunert, K. G. (2015). Relationship between the domains of the multidimensional students' life satisfaction scale, satisfaction with food-related life and happiness in university students. *Nutrición Hospitalaria*, 31(6), 2752–2763.
- Sentenac, H. (2015a). 400 million fewer animals were killed for food last year vs. 2007 because people are eating less meat. Retrieved from <http://latestvegannews.com/400-million-fewer-animals-were-killed-for-food-last-year-because-people-are-eating-less-meat/>
- Sentenac, H. (2015b). Exclusive: Research suggests 36% of Americans open to plant-based eating. Retrieved from <http://latestvegannews.com/research-suggests-36-of-americans-open-to-plant-based-eating/>
- Sentience Institute. (2017). Summary of evidence for foundational questions in Effective Animal Advocacy. Retrieved from <http://www.sentienceinstitute.org/foundational-questions-summaries>
- Sentience Politics. (n.d.). The importance of the far future. Retrieved from <https://sentience-politics.org/philosophy/the-importance-of-the-future/>
- Sethu, H. (2012). How many animals does a vegetarian save? Retrieved from <http://www.countinganimals.com/how-many-animals-does-a-vegetarian-save/>
- Sethu, H. (2013). A child raised to weigh 500 pounds by age 10? Retrieved from <http://www.countinganimals.com/a-child-raised-to-weigh-five-hundred-pounds-by-age-ten/>
- Shoham, A., & Ruvio, A. (2008). Opinion leaders and followers: A replication and extension. *Psychology & Marketing*, 25(3), 280–297.
- Sikkel, D., & Hoogendoorn, A. (2008). Panel surveys. In E. D. de Leeuw, J. J. Hox, & D. A. Dillman (Eds.), *International handbook of survey methodology* (pp. 479–499). New York, NY: Psychology Press.
- Simon, D. R. (2013a). *Meatonomics: How the rigged economics of meat and dairy make you consume too much and how to eat better, live longer, and spend smarter*. San Francisco, CA: Conari Press.
- Simon, D. R. (2013b). The meatonomic\$ index. Retrieved from <http://meatonomics.com/2013/08/22/meatonomics-index/>
- Singer, P. (1990). *Animal liberation*. New York, NY: Avon.
- Singer, P., & MacAskill, W. (2015). *Introduction*. (R. Carey, Ed.), *The effective altruism handbook*. Oxford, UK: Centre For Effective Altruism. Retrieved from http://careyryan.com/files/EA_Handbook.pdf
- Singer, P., & Mason, J. (2006). *The ethics of what we eat. Why our food choices matter*. London, UK: Rodale.
- Slater, J., Sevenhuysen, G., Edginton, B., & O'Neil, J. (2012). “Trying to make it all come together”: Structuration and employed mothers' experience of family food provisioning in Canada. *Health Promotion International*, 27(3), 405–415.
- Slocum, R. (2010). Race in the study of food. *Progress in Human Geography*, 35(3), 303–327.
- Smith, A. (2017). Our new research review process and call for external reviewers. Retrieved from <https://animalcharityevaluators.org/blog/research-review-process-call-for-external-reviewers/>
- Smyth, J. D., Dillman, D. A., & Christian, L. M. (2009). Context effects in web surveys: New issues and evidence. In A. Joinson, K. Y. A. McKenna, T. Postmes, & U.

- Reips (Eds.), *The Oxford handbook of Internet psychology* (pp. 427– 443). New York, NY: Oxford University Press.
- Spencer, E. H., Elon, L. K., & Frank, E. (2007). Personal and professional correlates of US medical students' vegetarianism. *Journal of the American Dietetic Association*, 107(1), 72–78.
- Stahler, C. (1994). How many vegetarians are there? Retrieved from <http://www.vrg.org/nutshell/poll.htm>
- Stahler, C. (2006). How many adults are vegetarian? Retrieved from http://www.vrg.org/journal/vj2006issue4/2006_issue4_poll.php
- Stahler, C. (2011). How often do Americans eat vegetarian meals? And how many adults in the U.S. are vegan? Retrieved from <http://www.vrg.org/journal/vj2011issue4/vj2011issue4poll.php>
- Stahler, C. (2012). How often do Americans eat vegetarian meals? And how many adults in the U.S. are vegetarian? Retrieved from <http://www.vrg.org/blog/2012/05/18/how-often-do-americans-eat-vegetarian-meals-and-how-many-adults-in-the-u-s-are-vegetarian/>
- Stahler, C. (2015). How often do Americans eat vegetarian meals? And how many adults in the U.S. are vegetarian? Retrieved from <http://www.vrg.org/blog/2015/05/29/how-often-do-americans-eat-vegetarian-meals-and-how-many-adults-in-the-u-s-are-vegetarian-2/>
- Subar, A. F., Freedman, L. S., Tooze, J. A., Kirkpatrick, S. I., Boushey, C., Neuhouser, M. L., ... Krebs-Smith, S. M. (2015). Addressing current criticism regarding the value of self-report dietary data. *Journal of Nutrition*, 145(12), 2639–2645.
- Taft, C. (2014). How do we best promote veganism?: A psychologist's perspective. Retrieved from <http://veganpublishers.com/how-do-we-best-promote-veganism-a-psychologists-perspective-casey-taft-ph-d/>
- Taft, C. (2015). Misuse of “effectiveness” language in animal advocacy. Retrieved from <http://veganpublishers.com/effectiveness/>
- The Humane Society of the United States. (2015). Farm animal statistics: Slaughter totals. Retrieved from http://www.humanesociety.org/news/resources/research/stats_slaughter_totals.html
- The Physicians Committee. (n.d.). The five worst contaminants in chicken products. Retrieved from <http://www.pcrm.org/health/reports/the-five-worst-contaminants-in-chicken-products>
- The Reducetarian Foundation. (n.d.). The reducetarian foundation. Retrieved from <https://reducetarian.org>
- The Vegetarian Resource Group. (n.d.). Most frequently asked questions. Retrieved from <http://www.vrg.org/nutshell/faq.htm#adult>
- The Vegetarian Resource Group. (1997). How many vegetarians are there? Retrieved from <http://www.vrg.org/journal/vj97sep/979poll.htm>
- The Vegetarian Resource Group. (2000). How many vegetarians are there? Retrieved from <http://www.vrg.org/nutshell/poll2000.htm>
- The Vegetarian Resource Group. (2003). How many vegetarians are there? Retrieved from http://www.vrg.org/journal/vj2003issue3/2003_issue3_poll.php
- The Vegetarian Resource Group. (2009). How many vegetarians are there? Retrieved from <http://www.vrg.org/press/2009poll.htm>
- The Vegetarian Resource Group. (2016). How many adults in the U.S are vegetarian and

- vegan? Retrieved from http://www.vrg.org/nutshell/Polls/2016_adults_veg.htm
- Thompson, D. (2015). The greatest good. Retrieved from <http://www.theatlantic.com/business/archive/2015/06/what-is-the-greatest-good/395768/#b06g25t20w15%0D>
- Thomson, C. A., Giuliano, A., Rock, C. L., Ritenbaugh, C. K., Flatt, S. W., Faerber, S., ... Marshall, J. R. (2003). Measuring dietary change in a diet intervention trial: Comparing food frequency questionnaire and dietary recalls. *American Journal of Epidemiology*, 157(8), 754–762.
- Tobler, C., Visschers, V. H. M., & Siegrist, M. (2011). Eating green. Consumers' willingness to adopt ecological food consumption behaviors. *Appetite*, 57(3), 674–682.
- Toepoel, V., Vis, C., Das, M., & van Soest, A. (2009). Design of web questionnaires: An information-processing perspective for the effect of response categories. *Sociological Methods & Research*, 37(3), 371–392.
- Tomasik, B. (2007). How much direct suffering is caused by various animal foods? Retrieved from <http://reducing-suffering.org/how-much-direct-suffering-is-caused-by-various-animal-foods/>
- Tourangeau, R., Conrad, F. G., & Couper, M. (2013). *The science of web surveys*. New York, NY: Oxford University Press.
- Truelove, H. B., & Parks, C. (2012). Perceptions of behaviors that cause and mitigate global warming and intentions to perform these behaviors. *Journal of Environmental Psychology*, 32(3), 246–259.
- Twigg, J. (1983). Vegetarianism and the meanings of meat. In A. Murcott (Ed.), *The Sociology of food and eating: Essays on the sociological significance of food* (pp. 18–30). Hants, England: Gower Publishing Company Limited.
- Twine, R. (2014). Vegan killjoys at the table—contesting happiness and negotiating relationships with food practices. *Societies*, 4(4), 623–639.
- United States Census Bureau. (n.d.-a). *Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2015 (NST-EST2015-01)*. Retrieved from <https://www.census.gov/popest/data/national/totals/2015/index.html>
- United States Census Bureau. (n.d.-b). *Census regions and divisions of the United States*. Retrieved from http://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf
- United States Census Bureau. (2016a). *Estimates of the total resident population and resident population age 18 years and older for the United States, States, and Puerto Rico: July 1, 2016*. Retrieved from <https://www2.census.gov/programs-surveys/popest/tables/2010-2016/state/detail/SCPRC-EST2016-18+POP-RES.xlsx>
- United States Census Bureau. (2016b). *Monthly population estimates for the United States: April 1, 2010 to December 1, 2017 (NA-EST2016-01)*. Retrieved from <https://www2.census.gov/programs-surveys/popest/tables/2010-2016/national/totals/na-est2016-01.xlsx>
- United States Census Bureau. (2017). U.S. and world population clock. Retrieved from <http://www.census.gov/popclock>
- United States Department of Agriculture. (n.d.). *Meat and livestock annual cumulative year-to-date U.S. trade*. Retrieved from www.ers.usda.gov/data-products/livestock-meat-international-trade-data.aspx

- United States Department of Agriculture. (2010). *Mortality of calves and cattle on U.S. beef cow-calf operations*. Retrieved from https://www.aphis.usda.gov/animal_health/nahms/beefcowcalf/downloads/beef0708/Beef0708_is_Mortality.pdf
- United States Department of Agriculture. (2016a). *Hatchery production 2015 summary*. Retrieved from <http://usda.mannlib.cornell.edu/usda/nass/HatcProdSu//2010s/2016/HatcProdSu-04-12-2016.pdf>
- United States Department of Agriculture. (2016b). *Livestock slaughter 2015 summary*. Retrieved from <http://usda.mannlib.cornell.edu/usda/current/LiveSlauSu/LiveSlauSu-04-20-2016.pdf>
- United States Department of Agriculture. (2016c). *Poultry slaughter 2015 summary*. Retrieved from <http://usda.mannlib.cornell.edu/usda/current/PoulSlauSu/PoulSlauSu-02-25-2016.pdf>
- United States Department of Health and Human Services. (2003). *Summary of the HIPAA privacy rule*. <https://doi.org/10.1016/j.chroma.2005.11.119>
- University of Dusseldorf. (n.d.). G*power: Statistical power analyses for Windows and Mac. Retrieved from <http://www.gpower.hhu.de>
- University of New Brunswick. (2011). *University policy on research involving humans*. Retrieved from http://es.unb.ca/apps/policy-repository/_resources/php/download-policy.php?id=YZqi
- Utrecht Summer School. (2015). Role play cognitive interviewing (handout).
- Vannette, D. (2016a). How to label response scale points in your survey to avoid misdirecting respondents. Retrieved from <https://www.qualtrics.com/blog/how-to-label-response-scale-points-in-your-survey-to-avoid-misdirecting-respondents/>
- Vannette, D. (2016b). Three ways to show your respondents that you appreciate them. Retrieved from <https://www.qualtrics.com/blog/three-ways-to-show-your-respondents-that-you-appreciate-them/>
- Vegan Outreach. (n.d.). Your choice: Why millions of people are choosing a better way to eat. Retrieved from <http://www.veganoutreach.org/YC.pdf>
- Veganuary. (2016). Veganuary 2016 spared the lives of millions of animals. Retrieved from <https://veganuary.com/blog/veganuary-2016-spared-the-lives-of-millions-of-animals/>
- Von Alt, S. (2015). How switching to chicken hurts more animals. Retrieved from <http://www.mercyforanimals.org/how-switching-to-chicken-hurts-more-animals>
- Ward, L. F. (1906). *Applied sociology: A treatise on the conscious improvement of society by society*. Boston, MA: Ginn and Company.
- Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques* (second edition). Los Angeles, CA: SAGE. Publications, Inc.
- White, R. F., Seymour, J., & Frank, E. (1999). Vegetarianism among US women physicians. *Journal of the American Dietetic Association*, 95(5), 595–598.
- Whyte, W. F. (1998). Rethinking sociology: Applied and basic research. *The American Sociologist*, 29(1), 16–19.
- Willets, A. (1997). “Bacon sandwiches got the better of me”: Meat-eating and vegetarianism in South-East London. In P. Caplan (Ed.), *Food, health, and identity*

- (pp. 111–130). New York, NY: Routledge.
- Willis, G. B. (2005). *Cognitive interviewing: A tool for improving questionnaire design*. Thousand Oaks, CA: SAGE Publications.
- Willis, G. B., & Lessler, J. T. (1999). *Question appraisal system QAS-99*. Atlanta GA.
- Wimberley, R. C. (1998). Applied sociology? Even musicians give concerts. *The American Sociologist*, 29(4), 5–19.
- Wyker, B. A., & Davison, K. K. (2010). Behavioral change theories can inform the prediction of young adults' adoption of a plant-based diet. *Journal of Nutrition Education and Behavior*, 42(3), 168–77.
- Xie, J., Sreenivasan, S., Korniss, G., Zhang, W., Lim, C., & Szymanski, B. K. (2011). Social consensus through the influence of committed minorities. *Physical Review E*, 84(1), 0111301–0111308.
- Yadav, R., & Pathak, G. S. (2016). Intention to purchase organic food among young consumers: Evidences from a developing nation. *Appetite*, 96, 122–128.
- Yeager, D. S., Krosnick, J. A., Chang, L., Javitz, H. S., Levendusky, M. S., Simpser, A., & Wang, R. (2011). Comparing the accuracy of RDD telephone surveys and Internet surveys conducted with probability and non-probability samples. *Public Opinion Quarterly*, 75(4), 709–747.

APPENDIX A – Research Questions

Which of several meat-restricted diets (a vegetarian diet, a reduced-meat diet, or a chicken-free diet) would best support an EAA approach to dietary outreach in the U.S.?

1. Prevalence and Opinion Leaders (Current Impact): Which of the three diets has the highest prevalence rate among American adults and the highest number of food opinion leaders based on current eating patterns?
 - a. Prevalence Rates (Current Impact): Which of the three diets has the highest prevalence rate among American adults based on current eating patterns?
 - b. Opinion Leaders (Current Impact): Which of the three diets has the highest number of food opinion leaders among American adults based on current eating patterns?
2. Prevalence and Opinion Leaders (Future Potential Impact): Which of the three diets is projected to have the highest prevalence rate among American adults and the highest number of food opinion leaders based on future potential eating patterns?
 - a. Prevalence Rates (Future Potential Impact): Which of the three diets is projected to have the highest prevalence rate among American adults based on future potential eating patterns?
 - b. Opinion Leaders (Future Potential Impact): Which of the three diets is projected to have the highest number of food opinion leaders among American adults based on future potential eating patterns?
3. Meat-Free Meals (Current Impact): Which of the three diets results in the largest number of meat-free meals eaten each week and the largest number of American adults this is spread amongst based on current eating patterns?

- a. Number of Meat-Free Meals (Current Impact): Which of the three diets results in the largest number of meat-free meals eaten by American adults each week based on current eating patterns?
 - b. Spread of Meat-Free Meals (Current Impact): Which of the three diets results in the largest number of American adults eating meat-free meals each week based on current eating patterns?
- 4. Meat-Free Meals (Future Potential Impact): Which of the three diets is projected to result in the largest number of meat-free meals eaten each week and the largest number of American adults this is spread amongst based on future potential eating patterns?
 - a. Number of Meat-Free Meals (Future Potential Impact): Which of the three diets is projected to result in the largest number of meat-free meals eaten by American adults each week based on future potential eating patterns?
 - b. Spread of Meat-Free Meals (Future Potential Impact): Which of the three diets is projected to result in the largest number of American adults eating meat-free meals each week based on future potential eating patterns?
- 5. Farmed Animals (Current Impact): Which of the three diets removes the largest number of land-based farmed animals raised for meat from the food stream based on American adults' current eating patterns?
- 6. Farmed Animals (Future Potential Impact): Which of the three diets is projected to remove the largest number of land-based farmed animals raised for meat from the food stream based on American adults' future potential eating patterns?

7. External Perceptions (Future Potential Impact): Which of the three diets has the best external perceptions among American adults who are not currently restricting their meat consumption?
- i. Familiarity (External Perceptions): Which of the three diets has the best outcome on diet familiarity among American adults who are not currently restricting their meat consumption?
 - ii. Social Ties (External Perceptions): Which of the three diets has the best outcome on social ties among American adults who are not currently restricting their meat consumption?
 - iii. Thermometer (External Perceptions): Which diet group has the best outcome on an attitude thermometer among American adults who are not currently restricting their meat consumption?
 - iv. Intentions (External Perceptions): Which of the three diets has the best outcome on intentions (TPB) among American adults who are not currently restricting their meat consumption?
 - v. Attitudes (External Perceptions): Which of the three diets has the best outcome on attitudes (TPB) among American adults who are not currently restricting their meat consumption?
 - vi. Perceived Behavioural Control (External Perceptions): Which of the three diets has the best outcome on perceived behavioural control (TPB) among American adults who are not currently restricting their meat consumption?
 - vii. Subjective Norms (External Perceptions): Which of the three diets has the best outcome on subjective norms (TPB) among American adults who are not currently restricting their meat consumption?

- viii. SWFL (External Perceptions): Which of the three diets has the best outcome on SWFL among American adults who are not currently restricting their meat consumption?
- ix. Convenience (External Perceptions): Which of the three diets has the best outcome on perceived convenience among American adults who are not currently restricting their meat consumption?
- x. Social/Personal Life (External Perceptions): Which of the three diets has the best outcome on social/personal life perceptions among American adults who are not currently restricting their meat consumption?
- xi. Health (External Perceptions): Which of the three diets has the best outcome on health perceptions among American adults who are not currently restricting their meat consumption?
- xii. Cost (External Perceptions): Which of the three diets has the best outcome on perceived cost among American adults who are not currently restricting their meat consumption?
- xiii. Motivation (External Perceptions): Which of the three diets has the best outcome on motivation among American adults who are not currently restricting their meat consumption?
- xiv. Identity (External Perceptions): Which of the three diets has the best outcome on identity perceptions among American adults who are not currently restricting their meat consumption?
- xv. Perception of Prevalence Rate (External Perceptions): Which of the three diets has the best outcome on perceived prevalence rates (relative to the

actual rate) among American adults who are not currently restricting their meat consumption?

- xvi. TTM SOC (External Perceptions): Which of the three diets has the best outcome on the TTM SOC among American adults who are not currently restricting their meat consumption?

- 8. Internal Experiences (Current Impact): Which of the three diets has the best internal experiences among American adults who are currently eating one of these meat-restricted diets?

- i. SWFL (Internal Experiences): Which of the three diets has the best outcome on SWFL among American adults who are currently eating one of these meat-restricted diets?
- ii. Social Ties (Internal Experiences): Which of the three diets has the best outcome on social ties among American adults who are currently eating one of these meat-restricted diets?
- iii. Intentions (Internal Experiences): Which of the three diets has the best outcome on intentions (TPB) among American adults who are currently eating one of these meat-restricted diets?
- iv. Attitudes (Internal Experiences): Which of the three diets has the best outcome on attitudes (TPB) among American adults who are currently eating one of these meat-restricted diets?
- v. Perceived Behavioural Control (Internal Experiences): Which of the three diets has the best outcome on perceived behavioural control (TPB) among American adults who are currently eating one of these meat-restricted diets?

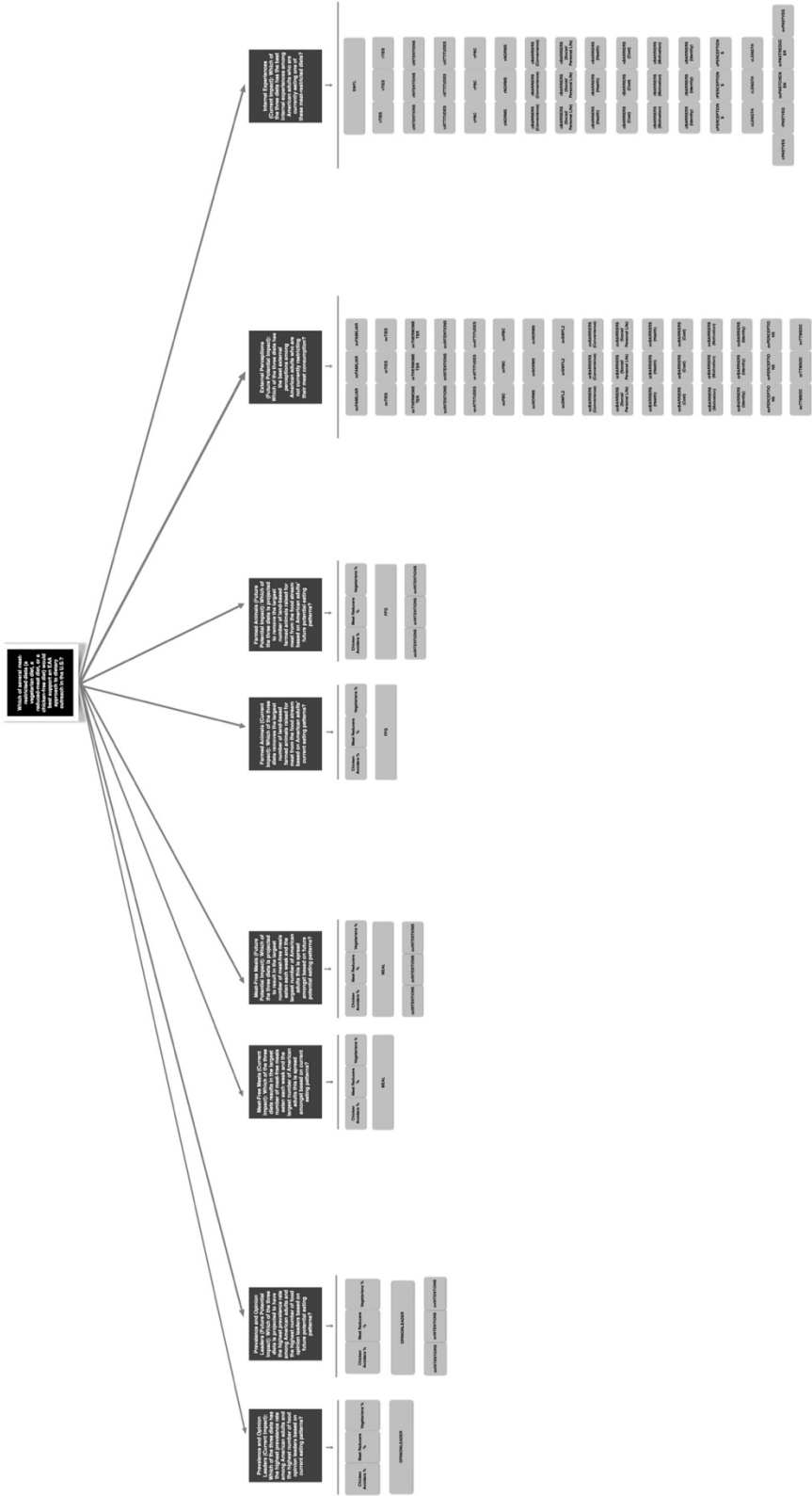
- vi. Subjective Norms (Internal Experiences): Which of the three diets has the best outcome on subjective norms (TPB) among American adults who are currently eating one of these meat-restricted diets?
- vii. Convenience (Internal Experiences): Which of the three diets has the best outcome on convenience among American adults who are currently eating one of these meat-restricted diets?
- viii. Social/Personal Life (Internal Experiences): Which of the three diets has the best outcome on the social/personal life among American adults who are currently eating one of these meat-restricted diets?
- ix. Health (Internal Experiences): Which of the three diets has the best outcome on health among American adults who are currently eating one of these meat-restricted diets?
- x. Cost (Internal Experiences): Which of the three diets has the best outcome on cost among American adults who are currently eating one of these meat-restricted diets?
- xi. Motivation (Internal Experiences): Which of the three diets has the best outcome on motivation among American adults who are currently eating one of these meat-restricted diets?
- xii. Identity (Internal Experiences): Which of the three diets has the best outcome on identity among American adults who are currently eating one of these meat-restricted diets?
- xiii. Perception of Prevalence Rate (Internal Experiences): Which of the three diets has the best outcome on perceived prevalence rates (relative to the

actual rate) among American adults who are currently eating one of these meat-restricted diets?

- xiv. Length of Diet Adherence (Internal Experiences): Which of the three diets has the best outcome on length of diet adherence among American adults who are currently eating one of these meat-restricted diets?
- xv. Diet Lapses (Internal Experiences): Which of the three diets has the best outcome on extent of diet lapses among American adults?

The research questions and the survey questions used to answer them are also presented in visual format below.

Figure 1. Research Questions



APPENDIX B – Survey Flow

Figure 2. Survey Flow 1



Figure 3. Survey Flow 2

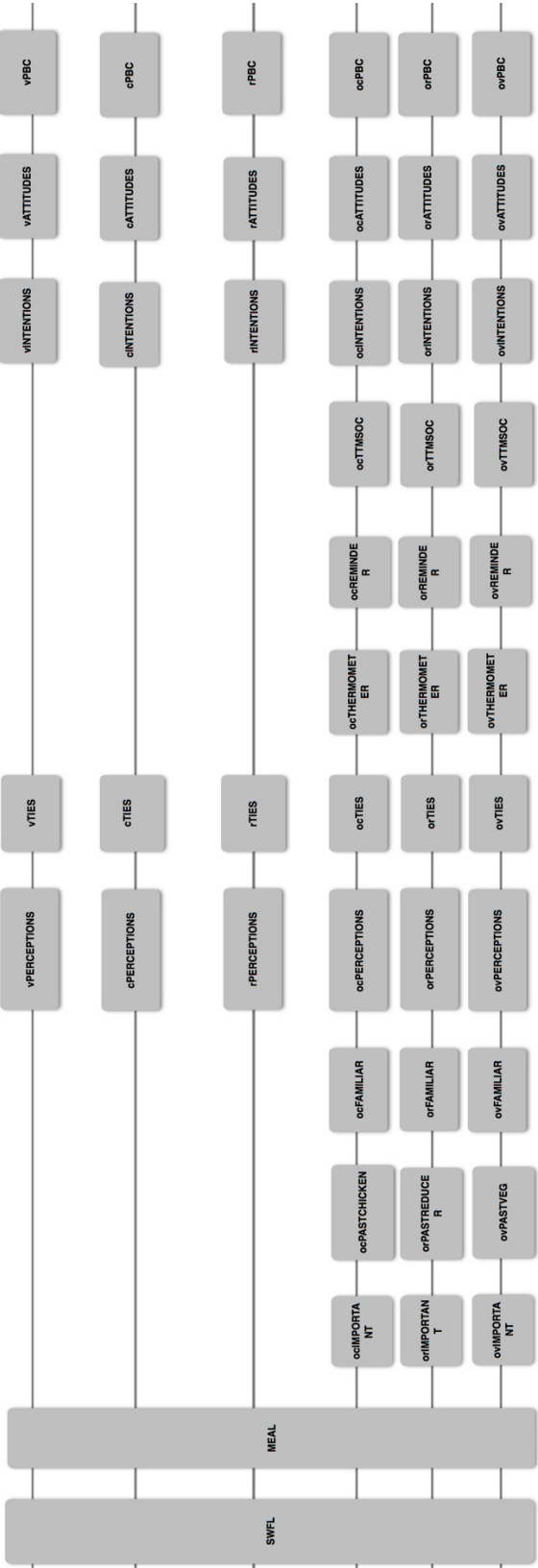


Figure 4. Survey Flow 3

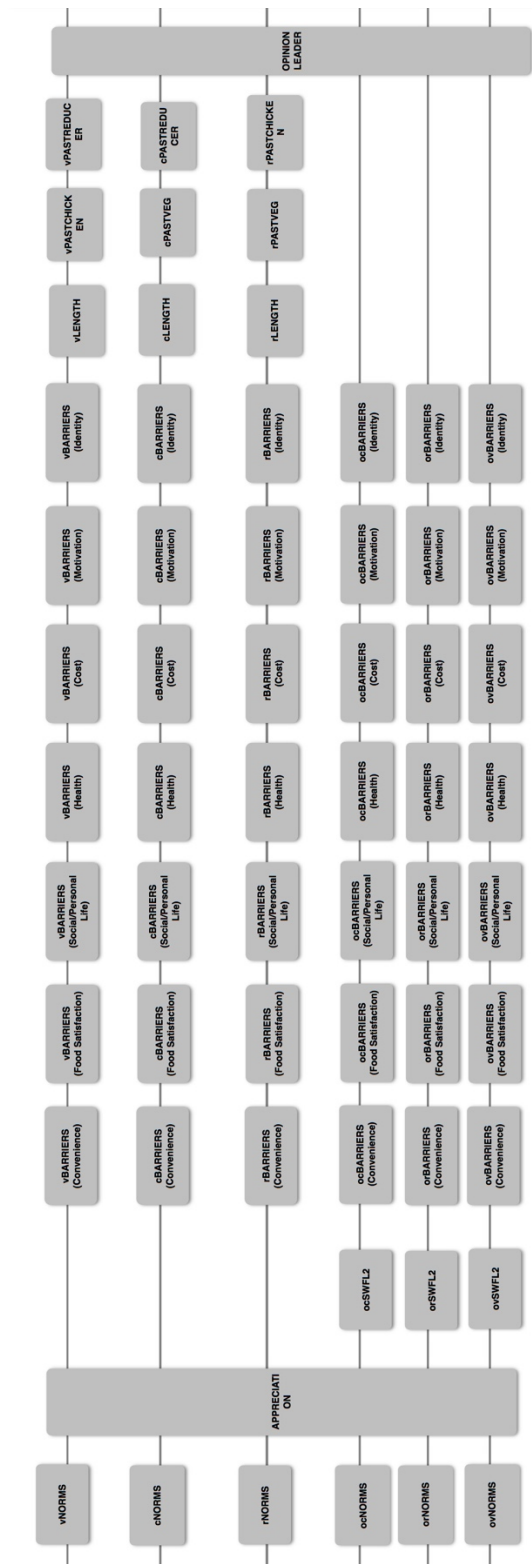
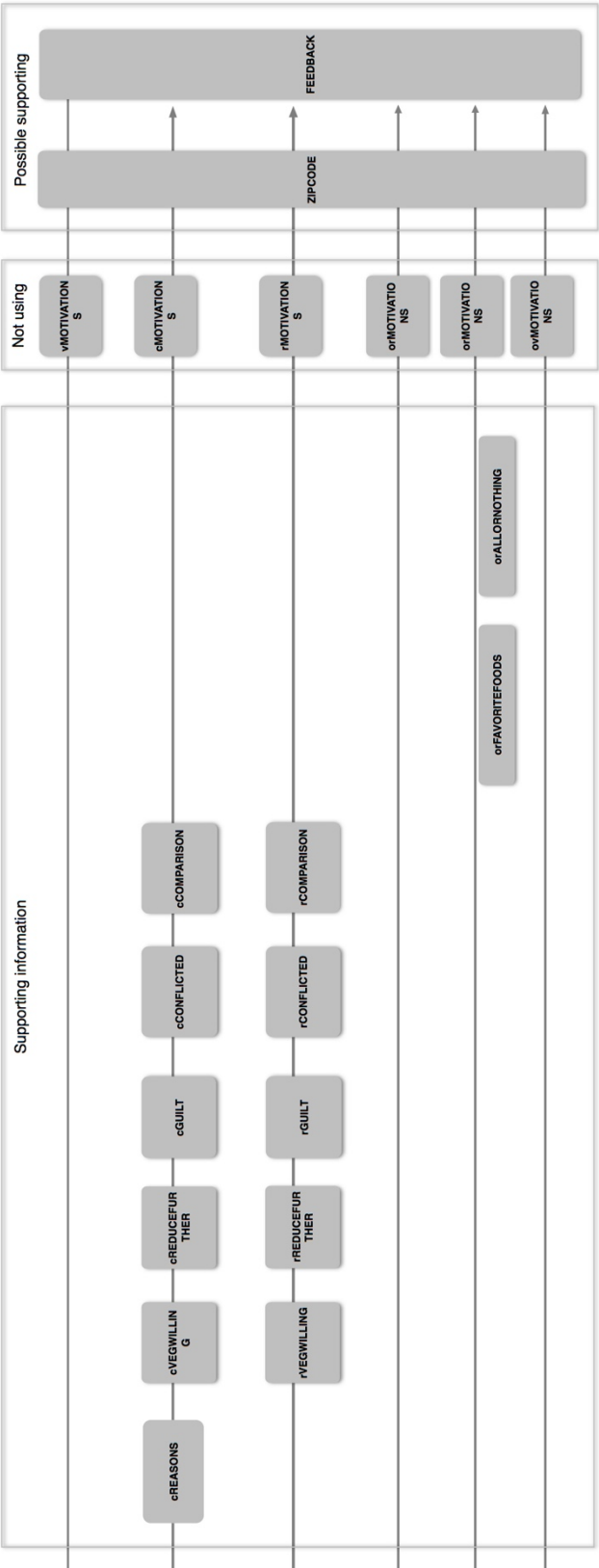


Figure 5. Survey Flow 4



APPENDIX C – Cognitive Interviewing Instructions and Probes

The guidelines that follow were read to participants before the cognitive interviews.

They are based on the work of Willis (2005, pp. 142, 143, 274):

- Thanks for coming here today to help me test a new survey.
- I'm not collecting information about you, so much as trying out my survey questions on a few people such as yourself, so that I can improve them prior to running the actual study.
- The plan is that I'll ask you questions and I'd like you to answer them, just like a regular survey.
- However, the goal here is to get a better idea of how the questions are working. So I'd like you to *think aloud* as you answer the questions—just tell me *everything* you are thinking about as you go about answering them (whether it seems important or not) so I can tell what you are thinking about as you answer.
- I'll also ask you how you're interpreting the question, about key terms or phrases, and what you think a question is asking about. I'll take notes and, as mentioned in the information letter, I'll also audiotape our conversation for my records.
- Please keep in mind that I really want to hear all of your opinions and reactions. Don't hesitate to speak up whenever something seems unclear, is hard to answer, or doesn't seem to apply to you. Also let me know if the question layout makes things unclear.
- Don't worry about being critical of the questions, our task today is to find out what's wrong with them.

- We'll take our time, but this should take roughly 45 minutes to 1 hour.
- Do you have any questions before we start?

The following probes were used in the interviews, and are based on the work of Willis (2005, pp. 48, 70, 72, 82, 275–286). The probes varied in type, including comprehension/interpretation probes, paraphrasing, confidence judgements, recall probes, specific probes, and general probes. At times the same probe was asked with slightly different wording.

- Any better way to ask this question?
- Any changes needed? Was that all clear?
- Anything about that question that makes it hard to know how to place yourself on that scale?
- Anything about that question that needs changing?
- Anything about the question that makes it easy/hard to answer?
- Anything about the question that needs fixing?
- Anything about the wording that needs addressing?
- Anything about this question that is confusing or unclear?
- Anything else about this question that makes it difficult?
- Anything else with the survey that needs changing?
- Anything I can do to make the survey better?
- Anything that could improve the question?
- Anything that could make this question clearer?
- Anything that didn't make sense?
- Anything that needs changing?

- Anything that needs to be clarified?
- Anything that would help that question?
- Anything you would change about that question?
- Are these three questions repetitive or get at different things?
- Are you thinking about just [], or if you [], etc?
- At this point are you getting tired about talking about []?
- At this point is it easy to answer questions about []? Do you need to remind yourself what it means?
- Better to take out of a grid format?
- Better to write in exact length or have ranges?
- Can you remember what we defined as []? Do you feel you need a reminder of the definition of [] at this point in the survey? Needed it earlier? May need it later? Don't need?
- Can you repeat the definition in your own words?
- Did you regard the examples of each type as an exhaustive list for which you shouldn't report anything not on it?
- Did you report []?
- Do the examples given fit how you define []?
- Do you have to give quite a bit of thought to this?
- Does it fit in with other questions asked thus far?
- Does it need something at the beginning like: "To what extent do you agree with the following statement"?
- Does that caveat at the beginning change your willingness?

- Does that question make sense?
- Does the question stick out at first compared to the others or seem peculiar?
- Easy/hard to answer?
- How confident do you feel in that answer?
- How did you decide what to report here? What are the main qualities that stand out that make you say what you did?
- How do you define []?
- How do you interpret the word []?
- How do you like the format of a grid, or the alternative to separate the questions out?
- How easy or difficult is it to remember your []?
- How easy/hard was this to answer? How sure are you of your answers?
- How much attention do you pay to how often you []?
- How much thought would you say you've given to this?
- How sure are you of your answer?
- How well do you remember this?
- In your own words, what is this question asking? Is it clear?
- Is [] the right term to use based on how you identify?
- Is any of the reverse wording confusing?
- Is it clear this does not include []?
- Is it cumbersome to always see []?
- Is it frustrating to answer? Does it invoke distrust?
- Is it reasonable to terminate people?

- Is negative wording confusing?
- Is that question clear?
- Is that wordy or confusing?
- Does the comparison to [] make sense?
- Is the layout of that table confusing?
- Is the math difficult for this?
- Is the negatively worded aspect of some questions confusing?
- Is the question clear or confusing? Anything that could make that question clearer?
- Is there a better way to phrase this?
- Is there any specific part of this question that is more difficult to answer than another?
- Is this definition easy or hard to understand?
- Is this how you define []? If not, did you follow the definition in the question or your own? Is there a better term?
- Tell me more about [].
- Thinking about general [] or specific to something like []?
- Was that comparison easy to understand?
- Was that easy or hard to answer with his fictional scenario?
- Was that easy or hard to answer? Was it easy to imagine yourself [] that way?
- Was that easy to answer? How much attention do you pay to how often you []?
- Was this exercise tough to get into this imagined state?
- What do you say []?

- What do you think about this set of questions?
- What do you think of this question?
- What does [] mean to you?
- What does [] mean to you? Does it fit how [] is defined in the question? If not, did you follow this definition or your own?
- What does the phrase [] mean to you? Is that wording confusing? Did you report []?
- What time period are you thinking of?
- Why did you say []?
- Would you change anything about this question?
- Would you prefer that each answer option was labelled?
- Would you prefer these questions to be asked individually rather than in a grid?

APPENDIX D – Dataset Flow Charts

Figure 6. Screened Sample

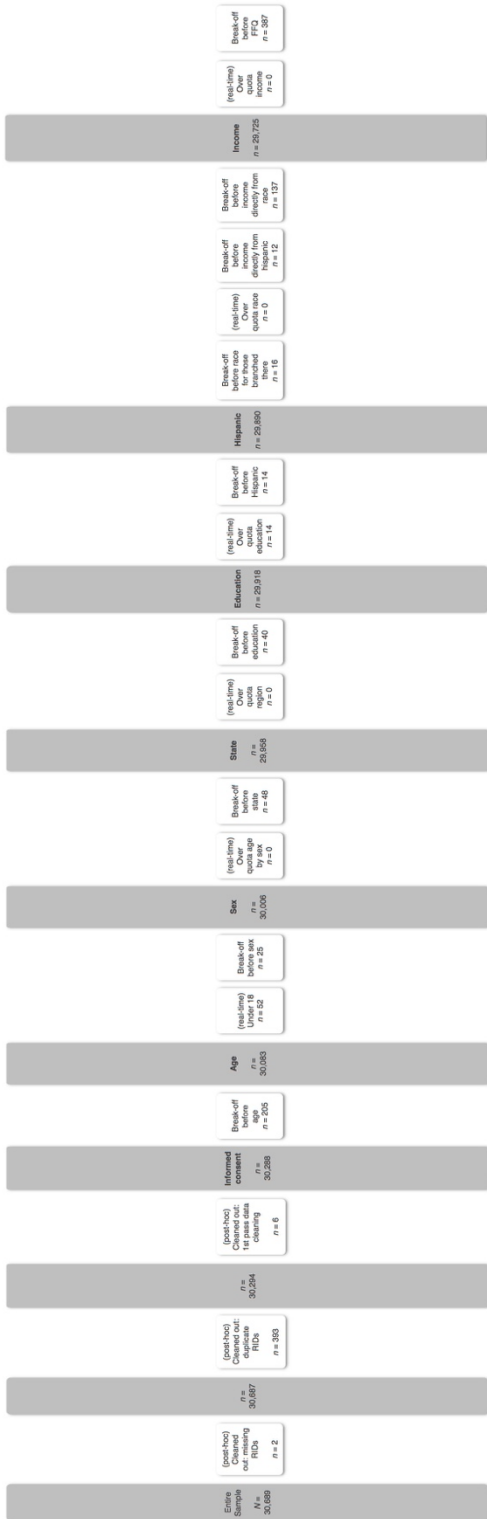


Figure 7. Screened Sample (cont'd)

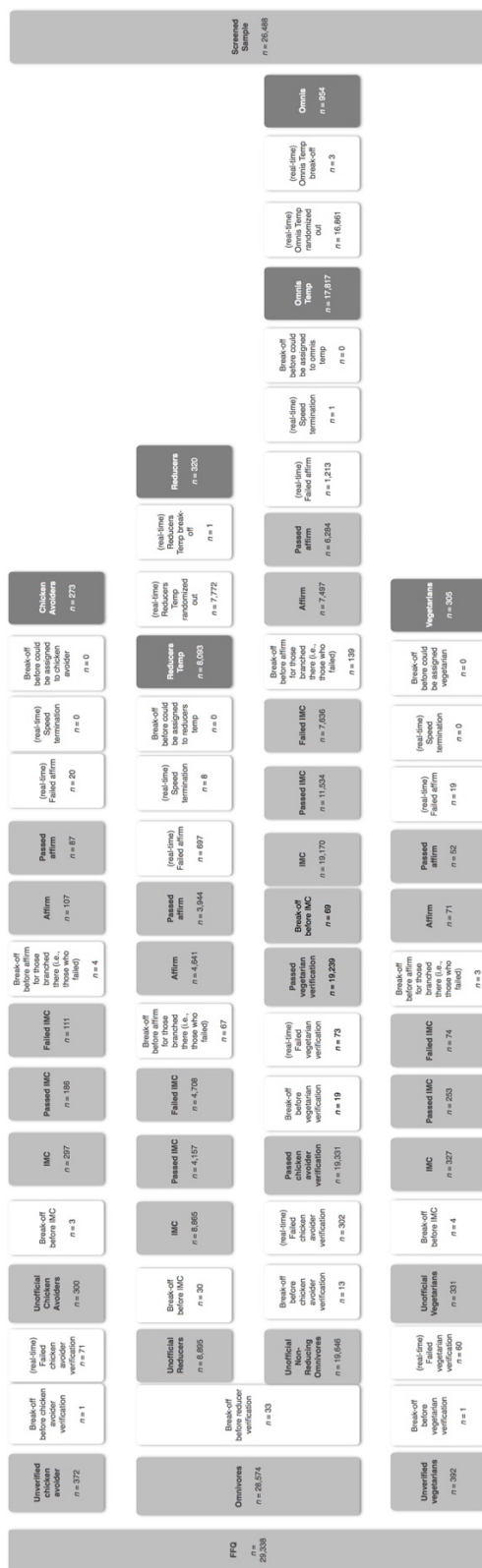


Figure 8. Weighted Cleaned Sample

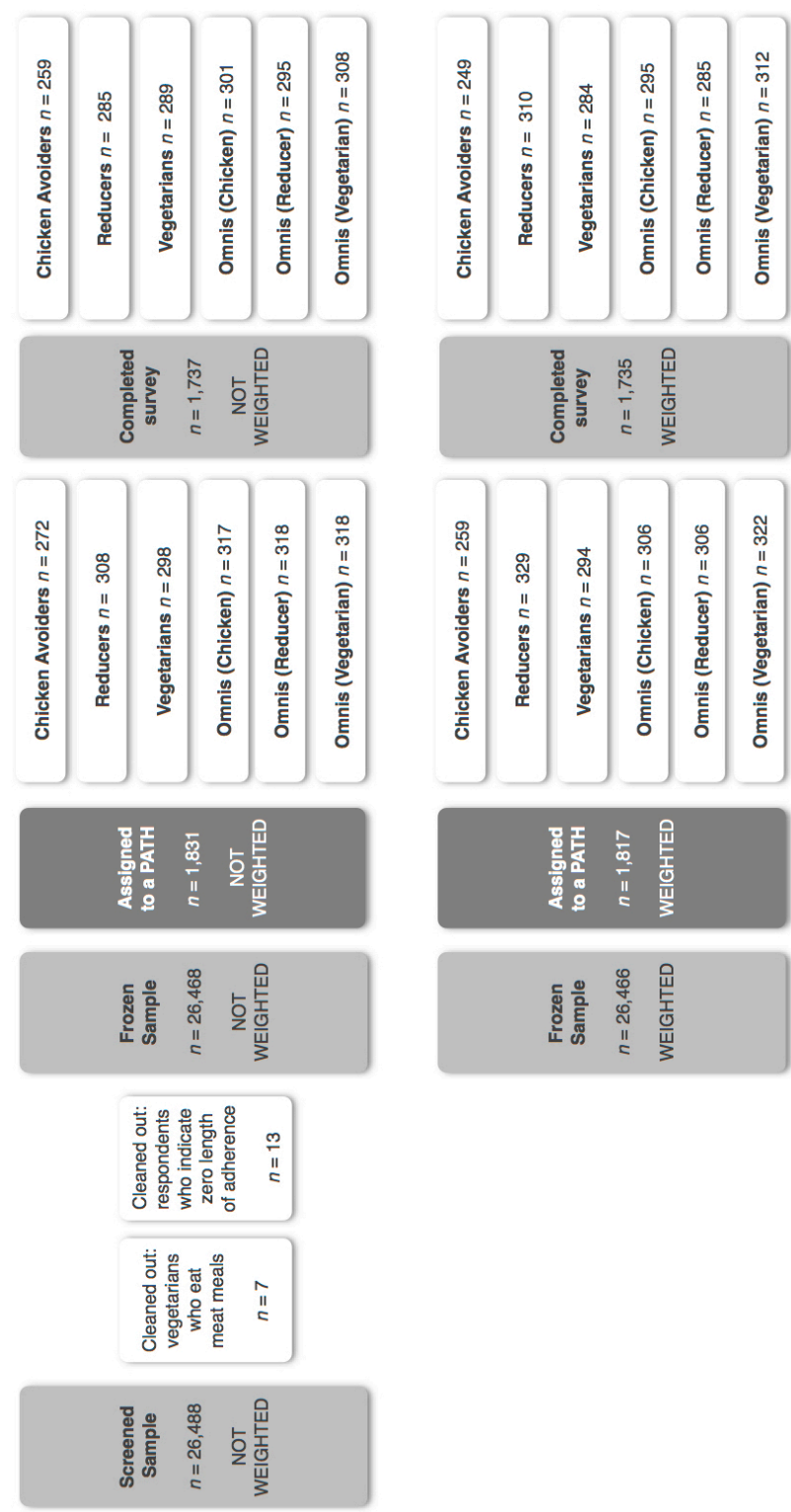
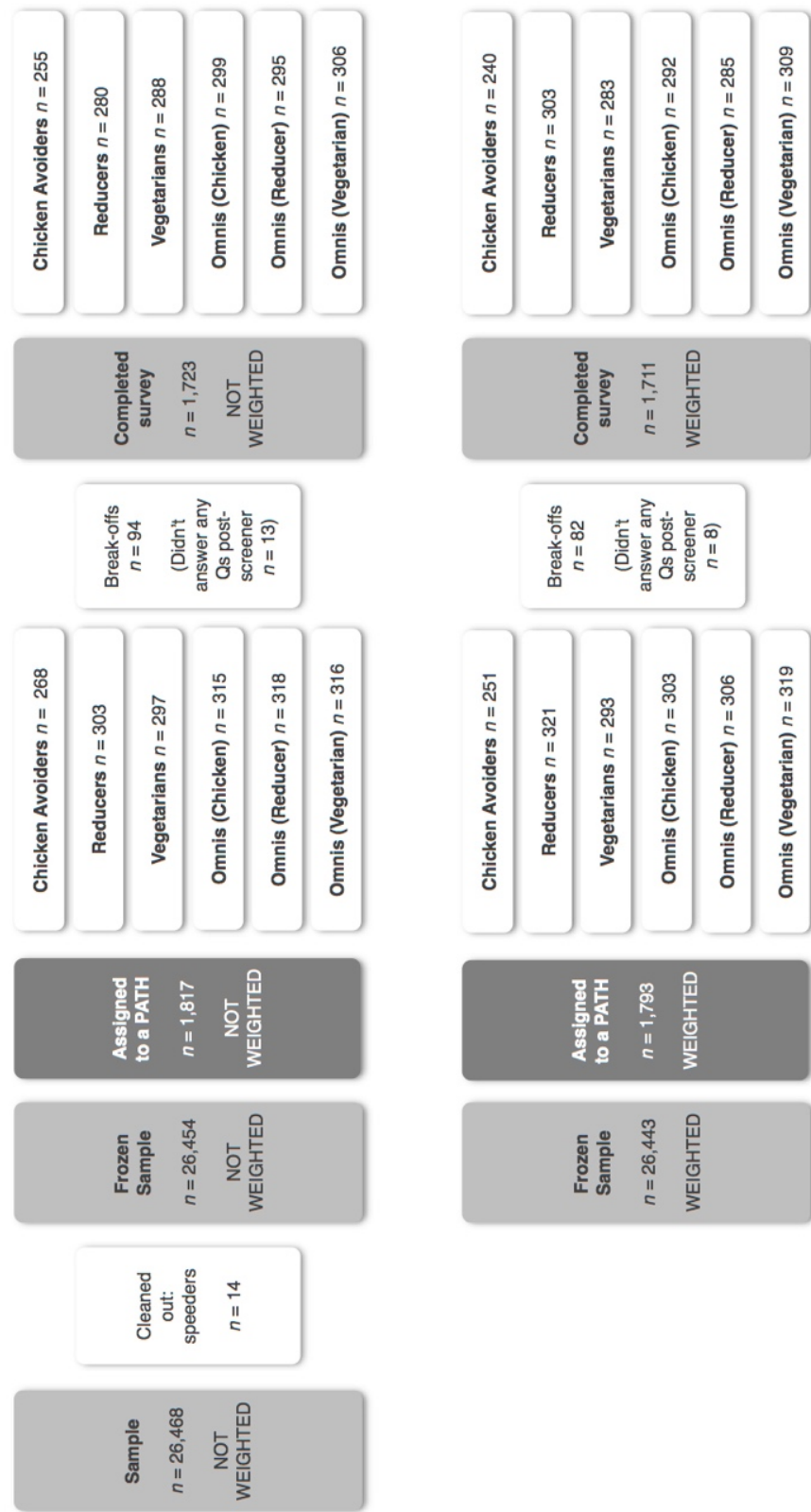


Figure 9. Frozen Analytic Sample



APPENDIX E – Meat Reducers Diet Discrepancy

The following FFQ was administered to all respondents in the screener:

- Question text: How often do you usually consume the following foods? Answer based on your current diet. *Think about all the meals and snacks you eat. Also think about everything you eat at home or outside the home. Please take your time and carefully consider each question individually.*
- Food list:
 - Beef (hamburger, steak, roast beef, meatloaf, in stews/lasagna/pasta/pizza, etc.)
 - Pork (bacon, ham, pork chops, spare ribs, bacon bits, etc.)
 - Chicken (wings, nuggets, chicken breast, chicken sandwich, in soup, etc.)
 - Turkey (turkey dinner, turkey sandwich, turkey burger, turkey bacon, in soup, etc.)
 - Fish, not including shellfish (salmon, tuna, fish sticks, haddock, fish & chips, etc.)
 - Shellfish (shrimp, lobster, scallops, oysters, crab, etc.)
 - Other meats (duck, lamb/sheep, goat, bison, etc.)
- Frequency Scale:
 - Never
 - 1-11 times per YEAR or less frequently
 - 1 time per MONTH
 - 2-3 times per MONTH
 - 1 time per WEEK

- 2-4 times per WEEK
- 5-6 times per WEEK
- 1 time per DAY
- 2 or more times per DAY

As is common practice, during analysis the frequency scale was converted into daily servings consumed. Each instance of consumption is said to represent one serving. The midpoint was used for frequencies presented as a range (Doidge & Segal, 2012; Pollard et al., 1998; Salvini et al., 1989). The “2 or more times per DAY” frequency was considered to represent 2.5 times per day (Pollard et al., 1998). Potential limitations stem from this conversion approach. See Table 41.

Table 41. FFQ Scale Conversion

9-point frequency scale	Conversion into mean daily servings	
Never	0.000	–
1-11 times per YEAR or less frequently	0.016	6 / 365
1 time per MONTH	0.033	(1 x 12) / 365
2-3 times per MONTH	0.082	(2.5 x 12) / 365
1 time per WEEK	0.142	1 x 52 / 365
2-4 times per WEEK	0.427	3 x 52 / 365
5-6 times per WEEK	0.784	5.5 x 52 / 365
1 time per DAY	1.000	–
2 or more times per DAY	2.500	–

Respondents who indicated that they eat one or more of the above foods (i.e., they did not select “never” in each instance) were asked: “Are you currently reducing the total amount of meat you eat, compared to a past diet? The term ‘meat’ includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.” Those who answered yes were labelled as meat reducers based on this self-identification.

Of concern, however, is that when using the transformed frequency variable, meat reducers self-reported eating more daily servings of meat (1.81 servings) than the

U.S. population (1.50 servings), the omnivore population (1.52 servings), and omnivores who do not report reducing their meat consumption (i.e., non-reducing omnivores) (1.39 servings). See Table 42.

Table 42. Mean Daily Servings (Transformation)

	Sample approximating U.S. adult population <i>n</i> = 26,466	Omnis <i>n</i> = 26,172	Non- reducing omnis <i>n</i> = 17,177	R <i>n</i> = 8,736	C <i>n</i> = 259	V <i>n</i> = 294
Beef	0.36	0.37	0.37	0.36	0.22	0.00
Pork	0.24	0.24	0.23	0.25	0.15	0.00
Chicken	0.41	0.42	0.41	0.44	0.00	0.00
Turkey	0.16	0.17	0.14	0.22	0.07	0.00
Fish	0.17	0.17	0.13	0.25	0.17	0.00
Shellfish	0.09	0.10	0.07	0.16	0.11	0.00
Other meats	0.07	0.07	0.04	0.13	0.06	0.00
Total meat	1.50	1.52	1.39	1.81	0.79	0.00
Total land meat (w/o fish & shellfish)	1.24	1.26	1.19	1.41	0.51	0.00

V = vegetarians, *R* = meat-reducers, *C* = chicken avoiders

Meat reducers reported consuming more daily servings of total meat ($M = 1.81$, $SE = 0.03$) than did non-reducing omnivores ($M = 1.39$, $SE = 0.01$), $t(11,015) = -15.12$, $p < 0.001$, $r = 0.14$, a small effect. Meat reducers also reported consuming more daily servings of land meat, i.e., meat excluding fish and shellfish ($M = 1.41$, $SE = 0.02$) than did non-reducing omnivores ($M = 1.19$, $SE = 0.01$), $t(11,491) = -10.24$, $p < 0.001$, $r = 0.10$, a small effect. The fact that meat reducers self-report eating more meat than those who do not claim to be reducing their meat consumption poses a potential limitation to this study. The inherent limitations of transforming a frequency measure into a servings measure may have a role to play.

A further concern is that the average meat consumption among U.S. adults coming from this data (1.50 daily servings) appears to be lower than other U.S. estimates, which adds further concern about the transformed FFQ data. One study that used available data sources to estimate U.S. meat consumption found that the U.S. population consumes 4.4 to 5.9 oz of meat per day (though importantly this was for those aged two years and over) (Fehrenbach, Righter, & Santo, 2016, p. 1). According to the American Heart Association (2017), a serving of meat is 2 to 3 oz, which would mean that the average U.S. consumption is in the range of 2.0 to 2.2 servings per day.

Table 43. Mean Frequency (1 to 9 Scale)

	Sample approximating U.S. adult population <i>n</i> = 26,466	Omnis <i>n</i> = 26,172	Non- reducing omnis <i>n</i> = 17,177	R <i>n</i> = 8,736	C <i>n</i> = 259	V <i>n</i> = 294
Beef	5.15	5.19	5.37	4.91	2.76	1.00
Pork	4.48	4.52	4.64	4.35	2.45	1.00
Chicken	5.54	5.59	5.67	5.56	1.00	1.00
Turkey	3.68	3.71	3.59	4.03	1.60	1.00
Fish	3.82	3.85	3.65	4.27	3.59	1.00
Shellfish	2.89	2.91	2.73	3.27	2.89	1.00
Other meats	2.06	2.08	1.89	2.46	1.39	1.00
Total meat	27.62	27.85	27.54	28.84	15.68	7.00
Total land meat (w/o fish & shellfish)	20.91	21.09	21.16	21.31	9.21	5.00

V = vegetarians, *R* = meat-reducers, *C* = chicken avoiders

The frequency of consumption can also be examined prior to any transformations.⁶² Though taking the mean of a scale with points that are not equidistant

⁶² To safeguard against the possibility that there were mistakes made during data cleaning, variable creation, or weighting, the FFQ figures were run on a copy of the original dataset, which showed similar

apart also has notable limitations. Table 43 shows that meat reducers report eating meat more frequently ($M = 28.84$) than the U.S. population ($M = 27.62$), the omnivore population ($M = 27.85$), and as well as the non-reducing omnivore population ($M = 27.54$).

Meat reducers reported consuming total meat ($M = 28.84$, $SE = 0.10$) with a greater frequency than did non-reducing omnivores ($M = 27.54$, $SE = 0.05$), $t(12,791) = -11.65$, $p < 0.001$, $r = 0.10$, a small effect. However, there was no association between meat reducers' reported frequency of consumption of land meat ($M = 21.31$, $SE = 0.07$) and that reported by non-reducing omnivores ($M = 21.16$, $SE = 0.30$), $t(12,854) = -1.81$, $p = 0.071$.

The median daily values showed a reversal of this trend, with meat reducers having a lower median value than the U.S. population, all omnivores, and non-reducing omnivores. See Table 44.

Table 44. Median Daily Servings (Transformation)

	Sample approximating U.S. adult Population $n = 26,466$	Omnis $n = 26,172$	Non-reducing omnis $n = 17,177$	Meat reducers $n = 8,736$
Total meat (median)	1.13	1.13	1.14	1.10

This indicates the possibility exists that a segment of meat reducers reported eating meat with greater frequency, which drove up the overall average. A total of 2,776 meat reducers (31.8%) reported eating more than 1.50 servings of meat daily (the U.S.

patterns. Likewise, the survey flow was double checked to ensure that respondents were not erroneously classified as meat reducers because of a survey programming issue. The labelling in the survey program was also double checked.

average). Likewise, 4,339 meat reducers (49.7%) had a mean score on the FFQ of more than 27.62 (the U.S. average). These findings suggest that a relatively notable proportion of meat reducers are heavier meat consumers than the average American.

Another food consumption variable measured frequency of consumption, which asked in the past seven days how many breakfasts, lunches, and dinners respondents ate, as well as how many of these meals contained meat. The total number of meatless meals eaten on a weekly basis was computed from this information. This showed that meat reducers reported eating fewer meat-based meals and more meatless meals than non-reducing omnivores.⁶³ A lower proportion of meat reducers' meals were meat-based and a higher proportion were meatless compared to non-reducing omnivores, which is a more expected result. See Table 45.

Table 45. Weekly Meal Consumption

	Non-reducing omnis	Meat reducers	Chicken avoiders	Vegetarians
Meals (mean) (<i>n</i> = 912, 312, 248 & 284)	14.9	13.0	15.1	15.1
Meat-based meals (mean) (<i>n</i> = 912, 311, 248 & 284)	10.0	8.0	4.7	0.0
Meat-based meals (as a % of all meals) (<i>n</i> = 814, 269, 234, 248)	67.8%	64.4%	34.3%	0.0%
Meatless meals (mean) (<i>n</i> = 885, 292, 248, 284)	5.2	5.4	10.4	15.1
Meatless meals (as a % of all meals) (<i>n</i> = 814, 269, 234, 248)	32.2%	35.6%	65.7%	100.0%

⁶³ This data is not available for the U.S. population or for the omnivore population.

Non-reducing omnivores reported consuming a higher number of meat-based meals each week ($M = 9.96$, $SE = 0.17$) than did meat reducers ($M = 8.04$, $SE = 0.30$), $t(1,221) = 5.66$, $p < 0.001$, $r = 0.16$, a small effect. However, there was no association between non-reducing omnivores' reported consumption of meatless meals each week ($M = 5.19$, $SE = 0.15$) and that reported by meat reducers ($M = 5.42$, $SE = 0.30$), $t(455) = -0.676$, $p = 0.499$.

The unintuitive findings for the FFQ brings limitations related to the meat reducers data in this dissertation, however the more intuitive findings for meal consumption do help somewhat mitigate these concerns. A scan of the final feedback question for meat reducers does not suggest that misclassification was a notable issue. Many refer to cutting back on meat (or at least red meat) and report several motivations for doing so (health, etc.). Several theories could explain why meat reducers self-report consuming meat with greater frequency:

1. Meat reducers may be more in tune with their meat consumption than the average person and so may have been better able to accurately answer the FFQ, while the others may have under-reported their meat consumption because they are not as aware of how much meat they eat and so assume they eat less than they do.
2. It is possible that meat reducers were higher consumers of meat than the average U.S. adult population prior to reducing. In this sense, while they are not below average with their consumption, they may be below the levels of a past diet as per the question wording: "Are you currently reducing the total amount of meat you eat, compared to a past diet?"

3. Even though meat reducers did not report eating meat less frequently than their non-reducing counterparts, they may still be reducing the total amount of meat they eat by eating smaller portion sizes, which this study was not designed to detect and which the procedure that transforms the FFQ into a daily consumption measure would mask.
4. Meat reducers may be reducing their consumption of certain types of meat (e.g., red meat), rather than total meat, and so may have erroneously answered yes to the question that asked about reductions of total meat, i.e., “Are you currently reducing the total amount of meat you eat, compared to a past diet? The term ‘meat’ includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.” Indeed, the untransformed FFQ shows that meat reducers report eating beef and pork less frequently, while they eat chicken with a somewhat similar frequency, and all other meats with greater frequency. If this is the case, misclassification would be a concern and thus would bring limitations.
5. It is also conceivable that if meat reducers had a higher average meat consumption prior to reducing that it may not be a matter of substitution effects—i.e., eating less red meat but more types of other meat in its place—but rather a lack of reduction for those higher categories (turkey, fish, shellfish, and other meats).
6. It is possible that many respondents said “yes” to being meat reducers even though they do not self-identify as such because they suspected this was a necessary step to pass the survey’s screener. Panel respondents are accustomed to taking surveys and being screened out if they do not meet the criteria. Since the FFQ was administered prior to the meat reducers check, these individuals

presumably would not have taken steps to adjust their FFQ. If deliberate misclassification was an issue, it would bring limitations to the dataset.

7. Finally, it is a possibility that many individuals erroneously believe that they are reducing their meat consumption when they are not. As Matt Ball (2015a) has explained: “Reach out to just about anyone considered to be a likely target for dietary change and ask them to ‘eat less meat,’ and they will almost universally reply, ‘Oh, I don’t eat much meat’ .” The literature also shows that individuals tend to over-report adherence to vegetarianism, with differences existing in how vegetarians self-identify (Haddad & Tanzman, 2003, p. 626S; Pribis, Pencak, & Grajales, 2010, p. 527; Ruby, 2012, p. 142; Spencer, Elon, & Frank, 2007, p. 73; White, Seymour, & Frank, 1999, p. 597; Willetts, 1997, pp. 115–116). While some self-professed vegetarians consume no meat, others occasionally include fish, poultry, and even red meat (Juan et al., 2015, p. 86; Ruby, 2012, p. 148), and this self-reporting leads to an over-estimation of the prevalence of vegetarians (Lea & Worsley, 2001, pp. 127–128). Therefore, it is conceivable that self-reports of meat reduction follow a similar trend, and this was not guarded against because there was no easy multi-step verification process given the nature of the definition used.

This discrepancy in the FFQ data speaks to potential issues with having individuals self-identify with the meat reducer label. A better way to identify meat reducers may have been to have them complete an FFQ with a portion size measure and classify respondents below a certain threshold as meat reducers. However, some individuals may have always eaten less meat than the average so they may not identify

as reducers, which would make asking them specific questions about their experiences with their reduced-meat diet challenging.

Given that the meal-based question did not raise the same concerns as the FFQ and it is not possible to know with certainty whether reducers misclassified themselves, it would be premature to refrain from using the meat reduction data in this dissertation. Likewise, FFQs, like other self-reported data, are known to have shortcomings (Archer et al., 2015), so it would be unwise to have this one question cloud the rest of the study, particularly because if the FFQ data had not been gathered there would have been no cause for concern. Indeed, the frequency scale was not set out ahead of time as a way that meat reducers would be identified.

Screeners and FFQs have been cautioned against to “describe a population’s intake in cross-sectional studies when interview time or resources are limited [...] because [of] the large systematic error,” where measurements diverge from the true value in a similar manner (National Cancer Institute, n.d.). Given the unexpected findings, a dietary assessment that uses specific memory (e.g., a 24-hour recall) or does not require memory (e.g., food records) would be preferable to a FFQ that requires generic memory along with the “ability to perform cognitively complex memory and averaging tasks” (National Cancer Institute, n.d.). This is a more time consuming and costly endeavour, however. While the meat reducer data is still valuable, the results should be viewed in light of its limitations.

APPENDIX F – Survey Instrument

PhD Research on Dietary Choices, Perceptions, & Experiences

CONSENT

Welcome! You have been invited to participate in this research study by Nielsen on behalf of myself, Kathryn Asher, a PhD candidate at the University of New Brunswick (UNB), in Fredericton, Canada. Your involvement will be tremendously helpful in advancing knowledge about the role of dietary choices, perceptions, and experiences. This is part of my doctoral dissertation research and may also see wider publication and distribution. The study is supervised by UNB Sociology professor Dr. Paul Peters (paul.peters@unb.ca, 506.458.7445).

As a study participant, you will be asked to complete an online survey, which will inquire about your attitudes and behaviors toward food and your demographic characteristics. Your participation in the study is expected to take 15 minutes or less.

To honor your time commitment, Nielsen will award you points based on pre-existing arrangements between you and the company.

You will NOT be asked to share your name, email address, or phone number. You will be asked about demographic characteristics (age, sex, state, zip code, etc.). Following reporting, the dataset will be released, however this will not include any identifying information from you.

This project has been reviewed by the Research Ethics Board of the University of New Brunswick and is on file as REB 2016-080. Your participation in the study is voluntary and you may withdraw at any time. To withdraw, simply close your web browser at any point. You can also contact me (kathryn.asher@unb.ca, 506.453.4849) to request that your data be withdrawn as well. The survey questions are mandatory, however you may withdraw from the study if there are any you do not wish to answer.

If you have any questions about your participation, please feel free to contact me or Dr. R. Steven Turner, Chair of UNB's Research Ethics Board (ethics@unb.ca, 506.453.5189).

Should you be interested, you can also contact me about the study's results once complete sometime in late 2017. Please also contact me if you have any technical issues while completing the survey.

If you are 18 years of age or older and agree to participate please click the "Next" button and you will be directed to the survey.

Please take your time and answer honestly. Thank you so much for participating!

Notes:

- *Text question*

AGE

How old are you?

☐ Under 18 (-1)

☐ 18 (18)

☐ 19 (19)

☐ 20 (20)

☐ 21 (21)

☐ 22 (22)

☐ 23 (23)

☐ 24 (24)

☐ 25 (25)

☐ 26 (26)

☐ 27 (27)

☐ 28 (28)

☐ 29 (29)

☐ 30 (30)

☐ 31 (31)

☐ 32 (32)

☐ 33 (33)

☐ 34 (34)

☐ 35 (35)

☐ 36 (36)

☐ 37 (37)

☐ 38 (38)

☐ 39 (39)

☐ 40 (40)

☐ 41 (41)

☐ 42 (42)

☐ 43 (43)

☐ 44 (44)

☐ 45 (45)

☐ 46 (46)

☐ 47 (47)

☐ 48 (48)

☐ 49 (49)

☐ 50 (50)

☐ 51 (51)

- 52 (52)
- 53 (53)
- 54 (54)
- 55 (55)
- 56 (56)
- 57 (57)
- 58 (58)
- 59 (59)
- 60 (60)
- 61 (61)
- 62 (62)
- 63 (63)
- 64 (64)
- 65 (65)
- 66 (66)
- 67 (67)
- 68 (68)
- 69 (69)
- 70 (70)
- 71 (71)
- 72 (72)
- 73 (73)
- 74 (74)
- 75 (75)
- 76 (76)
- 77 (77)
- 78 (78)
- 79 (79)
- 80 (80)
- 81 (81)
- 82 (82)
- 83 (83)
- 84 (84)
- 85 (85)
- 86 (86)
- 87 (87)
- 88 (88)
- 89 (89)
- 90 (90)
- 91 (91)
- 92 (92)

- ☐ 93 (93)
- ☐ 94 (94)
- ☐ 95 (95)
- ☐ 96 (96)
- ☐ 97 (97)
- ☐ 98 (98)
- ☐ 99 (99)
- ☐ 100+ (100)

Notes:

- *Multiple choice, dropdown list*
- *Force response*

SEX

What is your sex?

- ☐ Female (1)
- ☐ Male (2)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

STATE

In which state do you currently live?

- ☐ Alabama (1)
- ☐ Alaska (2)
- ☐ Arizona (3)
- ☐ Arkansas (4)
- ☐ California (5)
- ☐ Colorado (6)
- ☐ Connecticut (7)
- ☐ Delaware (8)
- ☐ District of Columbia (9)
- ☐ Florida (10)
- ☐ Georgia (11)
- ☐ Hawaii (12)
- ☐ Idaho (13)
- ☐ Illinois (14)
- ☐ Indiana (15)
- ☐ Iowa (16)
- ☐ Kansas (17)
- ☐ Kentucky (18)

- ☐ Louisiana (19)
- ☐ Maine (20)
- ☐ Maryland (21)
- ☐ Massachusetts (22)
- ☐ Michigan (23)
- ☐ Minnesota (24)
- ☐ Mississippi (25)
- ☐ Missouri (26)
- ☐ Montana (27)
- ☐ Nebraska (28)
- ☐ Nevada (29)
- ☐ New Hampshire (30)
- ☐ New Jersey (31)
- ☐ New Mexico (32)
- ☐ New York (33)
- ☐ North Carolina (34)
- ☐ North Dakota (35)
- ☐ Ohio (36)
- ☐ Oklahoma (37)
- ☐ Oregon (38)
- ☐ Pennsylvania (39)
- ☐ Rhode Island (40)
- ☐ South Carolina (41)
- ☐ South Dakota (42)
- ☐ Tennessee (43)
- ☐ Texas (44)
- ☐ Utah (45)
- ☐ Vermont (46)
- ☐ Virginia (47)
- ☐ Washington (48)
- ☐ West Virginia (49)
- ☐ Wisconsin (50)
- ☐ Wyoming (51)

Notes:

- *Multiple choice, dropdown list*
- *Force response*

EDUCATION

What is your highest level of education?

- ☐ Less than 12th grade, no diploma (1)
- ☐ High school diploma (or equivalent) (2)

- ☐ Some education after high school, no degree (3)
- ☐ College degree (associate, bachelor's, master's, or doctorate) (4)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

HISPANIC

Are you of Hispanic, Latino, or Spanish origin?

- ☐ Yes (1)
- ☐ No (2)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

RACE

What race do you consider yourself?

- ☐ African American or Black (1)
- ☐ Asian (2)
- ☐ White (3)
- ☐ Other race/ethnicity (including two or more) (4)

Notes:

- *Answer If Are you of Hispanic, Latino, or Spanish origin? No Is Selected*
- *Multiple choice, single answer*
- *Vertical*
- *Force response*

INCOME

What was your total annual household income in 2015?

For these purposes, a household is considered one or more persons who live in the same dwelling, and may include a family, a couple, a group of people who are unrelated, single individuals, etc. Please provide your best guess.

- ☐ \$14,999 or less (1)
- ☐ \$15,000 to \$24,999 (2)
- ☐ \$25,000 to \$34,999 (3)
- ☐ \$35,000 to \$49,999 (4)
- ☐ \$50,000 to \$74,999 (5)
- ☐ \$75,000 to \$99,999 (6)
- ☐ \$100,000 or over (7)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

SPEED

WARNING: It looks like you're moving pretty fast through the questions. To make sure your answer these questions and others in the survey correctly, please take time to read each question in full and carefully consider each answer individually.

Notes:

- Displayed when time < 30 seconds.
- Text question

FFQ

How often do you usually consume the following foods? Answer based on your current diet.

Think about all the meals and snacks you eat. Also think about everything you eat at home or outside the home. Please take your time and carefully consider each question individually.

	Never (1)	1-11 times per YEAR or less frequently (2)	1 time per MONTH (3)	2-3 times per MONTH (4)	1 time per WEEK (5)	2-4 times per WEEK (6)	5-6 times per WEEK (7)	1 time per DAY (8)	2 or more times per DAY (9)
Beef (hamburger, steak, roast beef, meatloaf, in stews/lasagna/pasta/pizza, etc.) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pork (bacon, ham, pork chops, spare ribs, bacon bits, etc.) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chicken (wings, nuggets, chicken breast, chicken sandwich, in soup,	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

etc.) (3)									
Turkey (turkey dinner, turkey sandwich, turkey burger, turkey bacon, in soup, etc.) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fish , not including shellfish (salmon, tuna, fish sticks, haddock, fish & chips, etc.) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shellfish (shrimp, lobster, scallops, oysters, crab, etc.) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other meats (duck, lamb/sheep, goat, bison, etc.) (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

cVERIFICATION

Are you currently excluding chicken from your diet?

- ☐ Yes (1)
☐ No (2)

Notes:

- *Answer If How often do you usually consume the following foods? Answer based on your current diet. Think about... Chicken (wings, nuggets, chicken breast, chicken sandwich, in soup, etc.) - Never Is Selected*
- *Matrix table, Likert, single answer*
- *Mobile friendly*
- *Force response*

rVERIFICATION

Are you currently reducing the total amount of meat you eat, compared to a past diet?

The term “meat” includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.

- ☐ Yes (1)
☐ No (2)

Notes:

- Answer If How often do you usually consume the following foods? Answer based on your current diet. Think about... **Chicken** (wings, nuggets, chicken breast, chicken sandwich, in soup, etc.) - Never Is Not Selected
- Multiple choice, single answer
- Vertical
- Force response

✓ VERIFICATION

Are you currently on a vegetarian or vegan diet (one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats)?

- ☐ Yes (1)
- ☐ No (2)

Notes:

- Answer If How often do you usually consume the following foods? Answer based on your current diet. Think about... **Beef** (hamburger, steak, roast beef, meatloaf, in stews/lasagna/pasta/pizza, etc.) - Never Is Selected And How often do you usually consume the following foods? Answer based on your current diet. Think about... **Pork** (bacon, ham, pork chops, spare ribs, bacon bits, etc.) - Never Is Selected And How often do you usually consume the following foods? Answer based on your current diet. Think about... **Chicken** (wings, nuggets, chicken breast, chicken sandwich, in soup, etc.) - Never Is Selected And How often do you usually consume the following foods? Answer based on your current diet. Think about... **Turkey** (turkey dinner, turkey sandwich, turkey burger, turkey bacon, in soup, etc.) - Never Is Selected And How often do you usually consume the following foods? Answer based on your current diet. Think about... **Fish**, not including shellfish (salmon, tuna, fish sticks, haddock, fish & chips, etc.) - Never Is Selected And How often do you usually consume the following foods? Answer based on your current diet. Think about... **Shellfish** (shrimp, lobster, scallops, oysters, crab, etc.) - Never Is Selected And How often do you usually consume the following foods? Answer based on your current diet. Think about... **Other meats** (duck, lamb/sheep, goat, bison, etc.) - Never Is Selected
- Multiple choice, single answer
- Vertical
- Force response

omni ✓ VERIFICATION

Are you currently excluding chicken from your diet?

- ☐ Yes (1)
- ☐ No (2)

Notes:

- *Answer If Are you currently reducing the total amount of meat you eat, compared to a past diet?The term “me... No Is Selected*
- *Multiple choice, single answer*
- *Vertical*
- *Force response*

omnivVERIFICATION

Are you currently on a vegetarian or vegan diet (one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats)?

- ☐ Yes (1)
- ☐ No (2)

Notes:

- *Answer If Are you currently reducing the total amount of meat you eat, compared to a past diet?The term “me... No Is Selected*
- *Multiple choice, single answer*
- *Vertical*
- *Force response*

IMC

There are many different types of lunch meats and reasons to be more familiar with one over another. I want to know which type of lunch meat people recognize most. I also want to know if people are paying attention to the question. To show that you’ve read this much, please select baked ham and salami as your two answers.

Which types of lunch meats are you most familiar with?

- ☐ Baked ham (1)
- ☐ Bierwurst sausage (2)
- ☐ Boiled ham (3)
- ☐ Chicken loaf (4)
- ☐ Corned beef (5)
- ☐ Dutch Loaf (6)
- ☐ Meatloaf (7)
- ☐ Pastrami (8)
- ☐ Pepperoni (9)
- ☐ Pimento loaf (10)
- ☐ Pork roll (11)
- ☐ Roast beef (12)
- ☐ Roast pork (13)
- ☐ Salami (14)
- ☐ Smoked ham (15)
- ☐ Summer sausage (16)
- ☐ Turkey breast (17)

Notes:

- Multiple choice, multiple answer
- 3 columns
- Force response

AFFIRM

WARNING. You provided an incorrect answer to a question measuring attention level. I know some survey participants do not pay close attention to the questions they are answering. Unfortunately, this affects the quality of the data for my PhD research. Please select one of the following honestly so that I know what to do with your data. Did you pay attention and answer honestly?

- ☐ Yes, keep my data (1)
- ☐ No, delete my data (2)

Notes:

- Answer If There are many different types of lunch meats and reasons to be more familiar with one over anoth... Baked ham Is Not Selected Or There are many different types of lunch meats and reasons to be more familiar with one over anoth... Salami Is Not Selected
- Multiple choice, single answer
- Vertical
- Force response

SWFL

Please think of all the things you do and experience in relation to food and meals (e.g., planning meals, shopping, preparing meals, eating meals) and then, using the scale below, indicate your level of agreement or disagreement with each item.

Please take your time and carefully consider each question.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
Food and meals are negative elements in my life (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am generally displeased with my food (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food and meals give me satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

in daily life (3)					
My life in relation to food and meals is close to my ideal (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to food, the conditions of my life are excellent (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

MEAL

Please take your time and carefully consider each question individually. If you ate more than 3 meals per day, please combine the additional meal(s) with the closest breakfast, lunch, or dinner. Please do not include snacks.

	Breakfasts (or 1st meal of your day) (1)	Lunches (or 2nd meal of your day) (2)	Dinners (or 3rd meal of your day) (3)
In the past <u>7 days</u>, how many of the following meals did you eat? (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In the past <u>7 days</u>, at how many of the following meals did you <u>eat meat</u> (i.e., beef, pork, chicken, turkey, fish, shellfish, or other meats)? (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notes:

- Matrix table, custom sum, total box statement
- Mobile friendly
- Custom validation
- Not able to be force response

cPERCEPTIONS

What percentage of the U.S. population 18 years of age or older do you think eats a chicken-free diet? *Please provide your best guess.*

_____ Percentage (1)

Notes:

- *Slider, 10 grid lines, min value 0, max value 100*
- *Show value*
- *Custom start position*
- *Mobile friendly*
- *Force response*

cTIES

To what extent, if any, do you have strong and extensive ties to people who eat a chicken-free diet?

- ☐ Not at all (1)
- ☐ Small extent (2)
- ☐ Moderate extent (3)
- ☐ Great extent (4)
- ☐ Very great extent (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

cINTENTIONS

I intend to continue eating my chicken-free in the future.

- ☐ Strongly disagree (1)
- ☐ Disagree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Agree (4)
- ☐ Strongly agree (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

cATTITUDES

Please rate your overall feelings towards a chicken-free diet on the following scales. *Please take your time and carefully consider each question.*

A chicken-free diet is: (1)	<input type="radio"/> unenjoyable (1)	<input type="radio"/> somewhat unenjoyable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat enjoyable (4)	<input type="radio"/> enjoyable (5)
A chicken-free diet is: (2)	<input type="radio"/> bad (1)	<input type="radio"/> somewhat bad (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat good (4)	<input type="radio"/> good (5)
A chicken-free diet is: (3)	<input type="radio"/> harmful (1)	<input type="radio"/> somewhat harmful (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat beneficial (4)	<input type="radio"/> beneficial (5)
A chicken-free diet is: (4)	<input type="radio"/> unpleasant (1)	<input type="radio"/> somewhat unpleasant (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat pleasant (4)	<input type="radio"/> pleasant (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

cPBC

Please take your time and carefully consider each question.

How much personal control, if any, do you feel you have over eating a chicken-free diet in the future? (2)	<input type="radio"/> no control (1)	<input type="radio"/> minor control (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderate control (4)	<input type="radio"/> complete control (5)
To what extent, if any, do you see yourself as capable of continuing to follow a chicken-free diet in the future? (3)	<input type="radio"/> not at all capable (1)	<input type="radio"/> slightly capable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> capable (4)	<input type="radio"/> very capable (5)
How easy or difficult do you think it would be to continue to follow a chicken-free diet in the future? (4)	<input type="radio"/> very difficult (1)	<input type="radio"/> difficult (2)	<input type="radio"/> neutral (3)	<input type="radio"/> easy (4)	<input type="radio"/> very easy (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

cNORMS

Please take your time and carefully consider each question.

The important people in my life think I should eat a chicken-free diet? (2)	<input type="radio"/> not at all (1)	<input type="radio"/> to a slight extent (2)	<input type="radio"/> neutral (3)	<input type="radio"/> to a moderate extent (4)	<input type="radio"/> to a very great extent (5)
How much, if at all, do you want to eat what the important people in your life think you should? (3)	<input type="radio"/> not at all (1)	<input type="radio"/> slightly (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderately (4)	<input type="radio"/> very much (5)

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

cAPPRECIATION

Note: Just a quick thanks for your responses up to this point. I truly value the time and effort you're putting into answering questions for my PhD research.

Now back to more survey questions!

Notes:

- *Text question*

cBARRIERS

To what extent do you agree or disagree with the following statements? *Please take your time and carefully consider each question.*

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
It is <u>inconvenient</u> for me to eat a chicken-free diet (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am <u>satisfied</u> with my food options (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My chicken-free diet creates issues in my <u>social and personal life</u> (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My chicken-free diet is good for my <u>health</u> (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It <u>costs</u> too much to eat a chicken-free diet (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is difficult for me to stay <u>motivated</u> enough to eat a chicken-free diet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I see a chicken-free diet as part of my <u>identity</u> (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

cLENGTH

Please give your best approximation to the question below, leaving any fields blank if you cannot remember that specific level of detail. Mark an “X” in the “Don’t know” field if you cannot remember any details. Please do not include times where you ate other diets in your answer. Please take your time and carefully consider your answer.

	Year(s) (1)	Month(s) (2)	Day(s) (3)	Don’t know (4)
How long have you been eating a chicken-free diet <u>without interruption</u> ? (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notes:

- Matrix table, text entry, short
- Mobile friendly
- Force response

cPASTVEG

In the past, have you ever adopted a vegetarian or vegan diet (one that excluded beef, pork, chicken, turkey, fish, shellfish, and other meats)?

☐ Yes (1)

☐ No (2)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

cPASTREDUCER

In the past, have you ever adopted a diet where you were reducing the total amount of meat you ate (compared to a past diet) while still eating chicken?

The term “meat” includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.

Yes (1)

No (2)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

rPERCEPTIONS

What percentage of the U.S. population 18 years of age or older do you think eats a reduced-meat diet? Please provide your best guess.

_____ Percentage (1)

Notes:

- *Slider, 10 grid lines, min value 0, max value 100*
- *Show value*
- *Custom start position*
- *Mobile friendly*
- *Force response*

rTIES

To what extent, if any, do you have strong and extensive ties to people who eat a reduced-meat diet?

- ☐ Not at all (1)
- ☐ Small extent (2)
- ☐ Moderate extent (3)
- ☐ Great extent (4)
- ☐ Very great extent (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

rINTENTIONS

I intend to continue eating my reduced-meat diet in the future.

- ☐ Strongly disagree (1)
- ☐ Disagree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Agree (4)
- ☐ Strongly agree (5)

Notes:

- *Multiple choice, single answer*

- *Horizontal*
- *Label position above*
- *Force response*

rATTITUDES

Please rate your overall feelings towards a reduced-meat diet on the following scales. Please take your time and carefully consider each question.

A reduced-meat diet is: (1)	<input type="radio"/> unenjoyable (1)	<input type="radio"/> somewhat unenjoyable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat enjoyable (4)	<input type="radio"/> enjoyable (5)
A reduced-meat diet is: (2)	<input type="radio"/> bad (1)	<input type="radio"/> somewhat bad (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat good (4)	<input type="radio"/> good (5)
A reduced-meat diet is: (3)	<input type="radio"/> harmful (1)	<input type="radio"/> somewhat harmful (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat beneficial (4)	<input type="radio"/> beneficial (5)
A reduced-meat diet is: (4)	<input type="radio"/> unpleasant (1)	<input type="radio"/> somewhat unpleasant (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat pleasant (4)	<input type="radio"/> pleasant (5)

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

rPBC

Please take your time and carefully consider each question.

How much personal control, if any, do you feel you have over eating a reduced-meat diet in the future? (2)	<input type="radio"/> no control (1)	<input type="radio"/> minor control (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderate control (4)	<input type="radio"/> complete control (5)
To what extent, if any, do you see yourself as capable of continuing to follow a reduced-meat diet in the future? (3)	<input type="radio"/> not at all capable (1)	<input type="radio"/> slightly capable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> capable (4)	<input type="radio"/> very capable (5)
How easy or difficult do you think it would be to continue	<input type="radio"/> very difficult	<input type="radio"/> difficult	<input type="radio"/> neutral	<input type="radio"/> easy (4)	<input type="radio"/> very easy (5)

to follow a reduced-meat diet in the future? (4)	(1)	(2)	(3)		
---	-----	-----	-----	--	--

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

rNORMS

Please take your time and carefully consider each question.

The important people in my life think I should eat a reduced-meat diet? (2)	<input type="radio"/> not at all (1)	<input type="radio"/> to a slight extent (2)	<input type="radio"/> neutral (3)	<input type="radio"/> to a moderate extent (4)	<input type="radio"/> to a very great extent (5)
How much, if at all, do you want to eat what the important people in your life think you should? (3)	<input type="radio"/> not at all (1)	<input type="radio"/> slightly (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderately (4)	<input type="radio"/> very much (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

rAPPRECIATION

Note: Just a quick thanks for your responses up to this point. I truly value the time and effort you're putting into answering questions for my PhD research.

Now back to more survey questions!

Notes:

- Text question

rBARRIERS

To what extent do you agree or disagree with the following statements? Please take your time and carefully consider each question.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
It is inconvenient for me to eat a reduced-meat diet (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with my food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

options (2)					
My reduced-meat diet creates issues in my social and personal life (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My reduced-meat diet is good for my health (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It costs too much to eat a reduced-meat diet (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is difficult for me to stay motivated enough to eat a reduced-meat diet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I see a reduced-meat diet as part of my identity (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

rLENGTH

Please give your best approximation to the question below, leaving any fields blank if you cannot remember that specific level of detail. Mark an “X” in the “Don’t know” field if you cannot remember any details. Please do not include times where you ate other diets in your answer. Please take your time and carefully consider your answer.

	Year(s) (1)	Month(s) (2)	Day(s) (3)	Don’t know (4)
How long have you been eating a reduced-meat diet <u>without interruption?</u> (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notes:

- Matrix table, text entry, short
- Mobile friendly
- Force response

rPASTVEG

In the past, have you ever adopted a vegetarian or vegan diet (one that excluded beef, pork, chicken, turkey, fish, shellfish, and other meats)?

- ☐ Yes (1)
- ☐ No (2)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

rPASTCHICKEN

In the past, have you ever adopted a diet that excluded chicken but did include meat of some kind?

The term “meat” includes any of the following: beef, pork, turkey, fish, shellfish, and other meats.

- ☐ Yes (1)
- ☐ No (2)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

vPERCEPTIONS

What percentage of the U.S. population 18 years of age or older do you think eats a vegetarian/vegan diet? Please provide your best guess.

_____ Percentage (1)

Notes:

- Slider, 10 grid lines, min value 0, max value 100
- Show value
- Custom start position
- Mobile friendly
- Force response

vTIES

To what extent, if any, do you have strong and extensive ties to people who eat a vegetarian/vegan diet?

- ☐ Not at all (1)
- ☐ Small extent (2)
- ☐ Moderate extent (3)
- ☐ Great extent (4)
- ☐ Very great extent (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above

- *Force response*

vINTENTIONS

I intend to continue eating my vegetarian/vegan diet in the future.

- ☐ Strongly disagree (1)
- ☐ Disagree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Agree (4)
- ☐ Strongly agree (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

vATTITUDES

Please rate your overall feelings towards a vegetarian/vegan diet on the following scales. Please take your time and carefully consider each question.

A vegetarian/vegan diet is: (1)	<input type="radio"/> unenjoyable (1)	<input type="radio"/> somewhat unenjoyable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat enjoyable (4)	<input type="radio"/> enjoyable (5)
A vegetarian/vegan diet is: (2)	<input type="radio"/> bad (1)	<input type="radio"/> somewhat bad (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat good (4)	<input type="radio"/> good (5)
A vegetarian/vegan diet is: (3)	<input type="radio"/> harmful (1)	<input type="radio"/> somewhat harmful (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat beneficial (4)	<input type="radio"/> beneficial (5)
A vegetarian/vegan diet is: (4)	<input type="radio"/> unpleasant (1)	<input type="radio"/> somewhat unpleasant (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat pleasant (4)	<input type="radio"/> pleasant (5)

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

vPBC

Please take your time and carefully consider each question.

How much personal control, if any, do you feel you have over eating a vegetarian/vegan diet in the future? (2)	<input type="radio"/> no control (1)	<input type="radio"/> minor control (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderate control (4)	<input type="radio"/> complete control (5)
To what extent, if any, do you see yourself as capable of continuing to follow a vegetarian/vegan diet in the future? (3)	<input type="radio"/> not at all capable (1)	<input type="radio"/> slightly capable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> capable (4)	<input type="radio"/> very capable (5)
How easy or difficult do you think it would be to continue to follow a vegetarian/vegan diet in the future? (4)	<input type="radio"/> very difficult (1)	<input type="radio"/> difficult (2)	<input type="radio"/> neutral (3)	<input type="radio"/> easy (4)	<input type="radio"/> very easy (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

vNORMS

Please take your time and carefully consider each question.

The important people in my life think I should eat a vegetarian/vegan diet? (2)	<input type="radio"/> not at all (1)	<input type="radio"/> to a slight extent (2)	<input type="radio"/> neutral (3)	<input type="radio"/> to a moderate extent (4)	<input type="radio"/> to a very great extent (5)
How much, if at all, do you want to eat what the important people in your life think you should? (3)	<input type="radio"/> not at all (1)	<input type="radio"/> slightly (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderately (4)	<input type="radio"/> very much (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

vAPPRECIATION

Note: Just a quick thanks for your responses up to this point. I truly value the time and effort you're putting into answering questions for my PhD research.

Now back to more survey questions!

Notes:

- Text question

vBARRIERS

To what extent do you agree or disagree with the following statements? *Please take your time and carefully consider each question.*

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
It is <u>inconvenient</u> for me to eat a vegetarian/vegan diet (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am <u>satisfied</u> with my food options (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My vegetarian/vegan diet creates issues in my <u>social and personal life</u> (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My vegetarian/vegan diet is good for my <u>health</u> (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It <u>costs</u> too much to eat a vegetarian/vegan diet (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is difficult for me to stay <u>motivated</u> enough to eat a vegetarian/vegan diet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I see a vegetarian/vegan diet as part of my <u>identity</u> (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

vLENGTH

Please give your best approximation to the question below, leaving any fields blank if you cannot remember that specific level of detail. Mark an “X” in the “Don’t know” field if you cannot remember any details. Please do not include times where you ate other diets in your answer. Please take your time and carefully consider your answer.

	Year(s) (1)	Month(s) (2)	Day(s) (3)	Don’t know (4)

How long have you been eating a vegetarian/vegan diet <u>without interruption</u> ? (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---	--------------------------	--------------------------	--------------------------	--------------------------

Notes:

- Matrix table, text entry, short
- Mobile friendly
- Force response

vPASTCHICKEN

In the past, have you ever adopted a diet that excluded chicken but did include meat of some kind?

The term “meat” includes any of the following: beef, pork, turkey, fish, shellfish, and other meats.

- ☐ Yes (1)
- ☐ No (2)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

vPASTREDUCER

In the past, have you ever adopted a diet where you were reducing the total amount of meat you ate (compared to a past diet) while still eating chicken?

The term “meat” includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.

- ☐ Yes (1)
- ☐ No (2)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

ocIMPORTANT

IMPORTANT: In the questions that follow, you will be asked about your thoughts on a chicken-free diet. This is a diet that excludes chicken but does include meat of some kind, i.e., includes beef, pork, turkey, fish, shellfish, and/or other meats.

- ☐ I have carefully read this explanation. (1)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

ocPASTCHICKEN

In the past, have you ever adopted a diet that excluded chicken but did include meat of some kind?

The term “meat” includes any of the following: beef, pork, turkey, fish, shellfish, and other meats.

- ☐ Yes (1)
- ☐ No (2)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

ocFAMILIAR

How familiar, if at all, are you with a chicken-free diet?

- ☐ Not at all familiar (1)
- ☐ Slightly familiar (2)
- ☐ Moderately familiar (3)
- ☐ Very familiar (4)
- ☐ Extremely familiar (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

ocPERCEPTIONS

What percentage of the U.S. population 18 years of age or older do you think eats a chicken-free diet? Please provide your best guess.

_____ Percentage (1)

Notes:

- Slider, 10 grid lines, min value 0, max value 100
- Show value
- Custom start position
- Mobile friendly
- Force response

ocTIES

To what extent, if any, do you have strong and extensive ties to people who eat a chicken-free diet?

- ☐ Not at all (1)
- ☐ Small extent (2)
- ☐ Moderate extent (3)
- ☐ Great extent (4)
- ☐ Very great extent (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

ocTHERMOMETER

I would like to get your feelings toward people who eat a chicken-free diet on a “feeling thermometer.” A rating of 0 degrees means you feel as cold and negative as possible. A rating of 100 degrees means you feel as warm and positive as possible. There is no right or wrong answer. What is most important is that you respond in a way that honestly reflects your impression towards this group.

My feelings toward people who eat a chicken-free diet is:

_____ Degrees (1)

Notes:

- *Slider, 10 grid lines, min value 0, max value 100*
- *Show value*
- *Custom start position*
- *Mobile friendly*
- *Force response*

ocREMINDER

REMINDER: You are being asked about your thoughts on a chicken-free diet. This is a diet that excludes chicken but does include meat of some kind, i.e., includes beef, pork, turkey, fish, shellfish, and/or other meats.

Notes:

- *Text question*

ocTTMSOC

Please choose the one statement that best describes you currently.

- ☐ I am not thinking about adopting a chicken-free diet (1)
- ☐ I am considering adopting a chicken-free diet (2)

☐ I have decided to but have not yet adopted a chicken-free diet (3)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

ocINTENTIONS

How willing, if at all, would you be to adopt a chicken-free diet in the future?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)
- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

ocATTITUDES

Please rate your overall feelings towards a chicken-free diet on the following scales.
Please take your time and carefully consider each question.

A chicken-free diet is: (1)	unenjoyable (1)	somewhat unenjoyable (2)	neutral (3)	somewhat enjoyable (4)	enjoyable (5)
A chicken-free diet is: (2)	<input type="radio"/> bad (1)	<input type="radio"/> somewhat bad (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat good (4)	<input type="radio"/> good (5)
A chicken-free diet is: (3)	<input type="radio"/> harmful (1)	<input type="radio"/> somewhat harmful (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat beneficial (4)	<input type="radio"/> beneficial (5)
A chicken-free diet is: (4)	<input type="radio"/> unpleasant (1)	<input type="radio"/> somewhat unpleasant (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat pleasant (4)	<input type="radio"/> pleasant (5)

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

ocPBC

Please take your time and carefully consider each question.

How much personal control, if any, do you feel you have over eating a chicken-free diet in the future? (2)	<input type="radio"/> no control (1)	<input type="radio"/> minor control (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderate control (4)	<input type="radio"/> complete control (5)
To what extent, if any, do you see yourself as capable of following a chicken-free diet in the future? (3)	<input type="radio"/> not at all capable (1)	<input type="radio"/> slightly capable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> capable (4)	<input type="radio"/> very capable (5)
How easy or difficult do you think it would be to follow a chicken-free diet in the future? (4)	<input type="radio"/> very difficult (1)	<input type="radio"/> difficult (2)	<input type="radio"/> neutral (3)	<input type="radio"/> easy (4)	<input type="radio"/> very easy (5)

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

ocNORMS

Please take your time and carefully consider each question.

The important people in my life think I should eat a chicken-free diet? (2)	<input type="radio"/> not at all (1)	<input type="radio"/> to a slight extent (2)	<input type="radio"/> neutral (3)	<input type="radio"/> to a moderate extent (4)	<input type="radio"/> to a very great extent (5)
How much, if at all, do you want to eat what the important people in your life think you should? (3)	<input type="radio"/> not at all (1)	<input type="radio"/> slightly (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderately (4)	<input type="radio"/> very much (5)

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

ocAPPRECIATION

Note: Just a quick thanks for your responses up to this point. I truly value the time and effort you're putting into answering questions for my PhD research.

Now back to more survey questions!

Notes:

- Text question

ocSWFL2

Please think of all the things you do and experience in relation to food and meals (e.g., planning meals, shopping, preparing meals, eating meals) and then, using the scale below, indicate your level of agreement or disagreement with each item imagining that you ate a chicken-free diet. Please take your time and carefully consider each question.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
If I ate a chicken-free diet, food and meals would be negative elements in my life (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a chicken-free diet, I would be generally displeased with my food (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a chicken-free diet, food and meals would give me satisfaction in daily life (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a chicken-free diet, my life in relation to food and meals would be close to my ideal (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a chicken-free diet, with regard to food, the conditions of my life would be excellent (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

ocBARRIERS

To what extent do you agree or disagree with the following statements? Please take your time and carefully consider each question.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
It would be <u>inconvenient</u> for me to eat a chicken-free diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(1) I would be <u>satisfied</u> with my food options if I ate a chicken-free diet (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A chicken-free diet would create issues in my <u>social and personal life</u> (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A chicken-free diet would be good for my <u>health</u> (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would <u>cost</u> too much to eat a chicken-free diet (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would be difficult for me to stay <u>motivated</u> enough to eat a chicken-free diet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would see a chicken-free diet as part of my <u>identity</u> (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

orIMPORTANT

IMPORTANT: In the questions that follow, you will be asked about your thoughts on a reduced-meat diet. This diet is followed by people who are reducing the total amount of meat they eat compared to a past diet. This does not include a vegetarian/vegan diet. The term “meat” includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.

☐ I have carefully read this explanation. (1)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

orPASTREDUCER

In the past, have you ever adopted a diet where you were reducing the total amount of meat you ate (compared to a past diet) while still eating chicken?

The term “meat” includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.

☐ Yes (1)

☐ No (2)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

orFAMILIAR

How familiar, if at all, are you with a reduced-meat diet?

- ☐ Not at all familiar (1)
- ☐ Slightly familiar (2)
- ☐ Moderately familiar (3)
- ☐ Very familiar (4)
- ☐ Extremely familiar (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

orPERCEPTIONS

What percentage of the U.S. population 18 years of age or older do you think eats a reduced-meat diet? *Please provide your best guess.*

_____ Percentage (1)

Notes:

- *Slider, 10 grid lines, min value 0, max value 100*
- *Show value*
- *Custom start position*
- *Mobile friendly*
- *Force response*

orTIES

To what extent, if any, do you have strong and extensive ties to people who eat a reduced-meat diet?

- ☐ Not at all (1)
- ☐ Small extent (2)
- ☐ Moderate extent (3)
- ☐ Great extent (4)
- ☐ Very great extent (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*

- *Force response*

orTHERMOMETER

I would like to get your feelings toward people who eat a reduced-meat diet on a “feeling thermometer.” A rating of 0 degrees means you feel as cold and negative as possible. A rating of 100 degrees means you feel as warm and positive as possible. There is no right or wrong answer. What is most important is that you respond in a way that honestly reflects your impression towards this group.

My feelings toward people who eat a reduced-meat diet is:

_____ Degrees (1)

Notes:

- *Slider, 10 grid lines, min value 0, max value 100*
- *Show value*
- *Custom start position*
- *Mobile friendly*
- *Force response*

orREMINDER

REMINDER: You are being asked about your thoughts on a reduced-meat diet. This diet is followed by people who are reducing the total amount of meat they eat compared to a past diet. This does not include a vegetarian/vegan diet. The term “meat” includes any of the following: beef, pork, chicken, turkey, fish, shellfish, and other meats.

Notes:

- *Text question*

orTTMSOC

Please choose the one statement that best describes you currently.

- ☐ I am not thinking about adopting a reduced-meat diet (1)
- ☐ I am considering adopting a reduced-meat diet (2)
- ☐ I have decided to but have not yet adopted a reduced-meat diet (3)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

orINTENTIONS

How willing, if at all, would you be to adopt a reduced-meat diet in the future?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)

- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

or ATTITUDES

Please rate your overall feelings towards a reduced-meat diet on the following scales. Please take your time and carefully consider each question.

A reduced-meat diet is: (1)	<input type="radio"/> unenjoyable (1)	<input type="radio"/> somewhat unenjoyable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat enjoyable (4)	<input type="radio"/> enjoyable (5)
A reduced-meat diet is: (2)	<input type="radio"/> bad (1)	<input type="radio"/> somewhat bad (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat good (4)	<input type="radio"/> good (5)
A reduced-meat diet is: (3)	<input type="radio"/> harmful (1)	<input type="radio"/> somewhat harmful (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat beneficial (4)	<input type="radio"/> beneficial (5)
A reduced-meat diet is: (4)	<input type="radio"/> unpleasant (1)	<input type="radio"/> somewhat unpleasant (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat pleasant (4)	<input type="radio"/> pleasant (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

or PBC

Please take your time and carefully consider each question.

How much personal control, if any, do you feel you have over eating a reduced-meat diet in the future? (2)	<input type="radio"/> no control (1)	<input type="radio"/> minor control (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderate control (4)	<input type="radio"/> complete control (5)
To what extent, if any, do you see yourself as capable of following a reduced-meat diet in the future?	<input type="radio"/> not at all capable	<input type="radio"/> slightly capable	<input type="radio"/> neutral (3)	<input type="radio"/> capable (4)	<input type="radio"/> very capable (5)

(3) How easy or difficult do you think it would be to follow a reduced-meat diet in the future? (4)	(1) <input type="radio"/> very difficult (1)	(2) <input type="radio"/> difficult (2)	<input type="radio"/> neutral (3)	<input type="radio"/> easy (4)	<input type="radio"/> very easy (5)
--	--	---	--------------------------------------	-----------------------------------	--

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

orNORMS

Please take your time and carefully consider each question.

The important people in my life think I should eat a reduced-meat diet? (2)	<input type="radio"/> not at all (1)	<input type="radio"/> to a slight extent (2)	<input type="radio"/> neutral (3)	<input type="radio"/> to a moderate extent (4)	<input type="radio"/> to a very great extent (5)
How much, if at all, do you want to eat what the important people in your life think you should? (3)	<input type="radio"/> not at all (1)	<input type="radio"/> slightly (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderately (4)	<input type="radio"/> very much (5)

Notes:

- *Matrix table, profile, single answer*
- *Mobile friendly*
- *Force response*

orAPPRECIATION

Note: Just a quick thanks for your responses up to this point. I truly value the time and effort you're putting into answering questions for my PhD research.

Now back to more survey questions!

Notes:

- *Text question*

orSWFL2

Please think of all the things you do and experience in relation to food and meals (e.g., planning meals, shopping, preparing meals, eating meals) and then, using the scale below, indicate your level of agreement or disagreement with each item imagining that you ate a reduced-meat diet. Please take your time and carefully consider each question.

	Strongly disagree	Disagree (2)	Neither agree nor	Agree (4)	Strongly agree
--	-------------------	-----------------	-------------------	--------------	----------------

	(1)		disagree (3)		(5)
If I ate a reduced-meat diet, food and meals would be negative elements in my life (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a reduced-meat diet, I would be generally displeased with my food (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a reduced-meat diet, food and meals would give me satisfaction in daily life (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a reduced-meat diet, my life in relation to food and meals would be close to my ideal (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a reduced-meat diet, with regard to food, the conditions of my life would be excellent (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

orBARRIERS

To what extent do you agree or disagree with the following statements? *Please take your time and carefully consider each question.*

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
It would be <u>inconvenient</u> for me to eat a reduced-meat diet (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be <u>satisfied</u> with my food options if I ate a reduced-meat diet (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A reduced-meat diet would create issues in my <u>social and personal life</u> (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A reduced-meat diet would be good for my <u>health</u> (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It would <u>cost</u> too much to eat a reduced-meat diet (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would be difficult for me to stay <u>motivated</u> enough to eat a reduced-meat diet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would see a reduced-meat diet as part of my <u>identity</u> (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

ovIMPORTANT

IMPORTANT: In the questions that follow, you will be asked about your thoughts on a vegetarian diet. This is a diet that does not include any meat i.e., one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats. A vegan diet is also included in this definition because it is also meat-free.

☐ I have carefully read this explanation. (1)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

ovPASTVEG

In the past, have you ever adopted a vegetarian or vegan diet (one that excluded beef, pork, chicken, turkey, fish, shellfish, and other meats)?

☐ Yes (1)

☐ No (2)

Notes:

- Multiple choice, single answer
- Vertical
- Force response

ovFAMILIAR

How familiar, if at all, are you with a vegetarian diet?

☐ Not at all familiar (1)

☐ Slightly familiar (2)

☐ Moderately familiar (3)

☐ Very familiar (4)

☐ Extremely familiar (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

ovPERCEPTIONS

What percentage of the U.S. population 18 years of age or older do you think eats a vegetarian diet? Please provide your best guess.

_____ Percentage (1)

Notes:

- Slider, 10 grid lines, min value 0, max value 100
- Show value
- Custom start position
- Mobile friendly
- Force response

ovTIES

To what extent, if any, do you have strong and extensive ties to people who eat a vegetarian diet?

- ☐ Not at all (1)
- ☐ Small extent (2)
- ☐ Moderate extent (3)
- ☐ Great extent (4)
- ☐ Very great extent (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

ovTHERMOMETER

I would like to get your feelings toward people who eat a vegetarian diet on a “feeling thermometer.” A rating of 0 degrees means you feel as cold and negative as possible. A rating of 100 degrees means you feel as warm and positive as possible. There is no right or wrong answer. What is most important is that you respond in a way that honestly reflects your impression towards this group.

My feelings toward people who eat a vegetarian diet is:

_____ Degrees (1)

Notes:

- Slider, 10 grid lines, min value 0, max value 100

- *Show value*
- *Custom start position*
- *Mobile friendly*
- *Force response*

ovREMINDER

REMINDER: You are being asked about your thoughts on a vegetarian diet. This is a diet that does not include any meat i.e., one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats. A vegan diet is also included in this definition because it is also meat-free.

Notes:

- *Text question*

ovTTMSOC

Please choose the one statement that best describes you currently.

- ☐ I am not thinking about adopting a vegetarian diet (1)
- ☐ I am considering adopting a vegetarian diet (2)
- ☐ I have decided to but have not yet adopted a vegetarian diet (3)

Notes:

- *Multiple choice, single answer*
- *Vertical*
- *Force response*

ovINTENTIONS How willing, if at all, would you be to adopt a vegetarian diet in the future?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)
- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

ovATTITUDES

Please rate your overall feelings towards a vegetarian diet on the following scales. Please take your time and carefully consider each question.

A vegetarian	<input type="radio"/>	<input type="radio"/> somewhat	<input type="radio"/>	<input type="radio"/> somewhat	<input type="radio"/>

diet is: (1)	unenjoyable (1)	unenjoyable (2)	neutral (3)	enjoyable (4)	enjoyable (5)
A vegetarian diet is: (2)	<input type="radio"/> bad (1)	<input type="radio"/> somewhat bad (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat good (4)	<input type="radio"/> good (5)
A vegetarian diet is: (3)	<input type="radio"/> harmful (1)	<input type="radio"/> somewhat harmful (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat beneficial (4)	<input type="radio"/> beneficial (5)
A vegetarian diet is: (4)	<input type="radio"/> unpleasant (1)	<input type="radio"/> somewhat unpleasant (2)	<input type="radio"/> neutral (3)	<input type="radio"/> somewhat pleasant (4)	<input type="radio"/> pleasant (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

ovPBC

Please take your time and carefully consider each question.

How much personal control, if any, do you feel you have over eating a vegetarian diet in the future? (2)	<input type="radio"/> no control (1)	<input type="radio"/> minor control (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderate control (4)	<input type="radio"/> complete control (5)
To what extent, if any, do you see yourself as capable of following a vegetarian diet in the future? (3)	<input type="radio"/> not at all capable (1)	<input type="radio"/> slightly capable (2)	<input type="radio"/> neutral (3)	<input type="radio"/> capable (4)	<input type="radio"/> very capable (5)
How easy or difficult do you think it would be to follow a vegetarian diet in the future? (4)	<input type="radio"/> very difficult (1)	<input type="radio"/> difficult (2)	<input type="radio"/> neutral (3)	<input type="radio"/> easy (4)	<input type="radio"/> very easy (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

ovNORMS

Please take your time and carefully consider each question.

The important people in my	<input type="radio"/> not	<input type="radio"/> to a	<input type="radio"/>	<input type="radio"/> to a	<input type="radio"/> to a

life think I should eat a vegetarian diet? (2)	at all (1)	slight extent (2)	neutral (3)	moderate extent (4)	very great extent (5)
How much, if at all, do you want to eat what the important people in your life think you should? (3)	<input type="radio"/> not at all (1)	<input type="radio"/> slightly (2)	<input type="radio"/> neutral (3)	<input type="radio"/> moderately (4)	<input type="radio"/> very much (5)

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

ovAPPRECIATION

Note: Just a quick thanks for your responses up to this point. I truly value the time and effort you're putting into answering questions for my PhD research.

Now back to more survey questions!

Notes:

- Text question

ovSWFL2

Please think of all the things you do and experience in relation to food and meals (e.g., planning meals, shopping, preparing meals, eating meals) and then, using the scale below, indicate your level of agreement or disagreement with each item imagining that you ate a vegetarian diet. Please take your time and carefully consider each question.

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
If I ate a vegetarian diet, food and meals would be negative elements in my life (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a vegetarian diet, I would be generally displeased with my food (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a vegetarian diet, food and meals would give me satisfaction in daily life (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I ate a vegetarian diet, my life in relation to food and meals would be close to my	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ideal (4) If I ate a vegetarian diet, with regard to food, the conditions of my life would be excellent (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

Notes:

- Matrix table, profile, single answer
- Mobile friendly
- Force response

ovBARRIERS

To what extent do you agree or disagree with the following statements? *Please take your time and carefully consider each question.*

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
It would be <u>inconvenient</u> for me to eat a vegetarian diet (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be <u>satisfied</u> with my food options if I ate a vegetarian diet (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A vegetarian diet would create issues in my <u>social and personal life</u> (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A vegetarian diet would be good for my <u>health</u> (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would <u>cost</u> too much to eat a vegetarian diet (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would be difficult for me to stay <u>motivated</u> enough to eat a vegetarian diet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would see a vegetarian diet as part of my identity (7)					

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

OPINIONLEADER

For each of the statements below, please choose the option that most closely matches your view. *Please take your time and carefully consider each question.*

	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
My opinion on food seems not to count with other people (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When they choose what to eat, other people do not turn to me for advice (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other people rarely come to me for advice about choosing what to eat (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People that I know pick what to eat based on what I have told them (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often persuade other people to buy foods that I like (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often influence people's opinions about food (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes:

- *Matrix table, Likert, single answer*
- *Mobile friendly*
- *Force response*

cREASONS

What is your reason for currently excluding chicken from your diet? Please explain in as much detail as possible.

Notes:

- *Text entry, multi line*
- *Force response*

cVEGWILLING

How willing, if at all, are you to adopt a vegetarian diet (one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats)?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)
- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

cREDUCEFURTHER

How willing, if at all, are you to reduce the total amount of meat you eat (compared to your current level of consumption)?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)
- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

cGUILT

To what extent do you agree or disagree with the following statement: Even small reductions of meat have an impact so I do not feel guilty that I am not reducing more.

- ☐ Strongly disagree (1)
- ☐ Disagree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Agree (4)
- ☐ Strongly agree (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

cCONFLICTED

How conflicted, if at all, are you because you feel there are problems with meat but still consume it?

- ☐ Not at all conflicted (1)
- ☐ Slightly conflicted (2)
- ☐ Moderately conflicted (3)
- ☐ Very conflicted (4)

☐ Extremely conflicted (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

cCOMPARISON

In comparison to a vegetarian diet (one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats), I suspect being on a chicken-free diet is in general...

- ☐ Much worse (1)
☐ Somewhat worse (2)
☐ About the same (3)
☐ Somewhat better (4)
☐ Much better (5)
☐ Don't know (6)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

cMOTIVATIONS

Which of the following motivates you to eat a chicken-free diet?

	Yes (1)	No (2)
Animal protection (1)	<input type="radio"/>	<input type="radio"/>
Concern for the environment (2)	<input type="radio"/>	<input type="radio"/>
Cost (3)	<input type="radio"/>	<input type="radio"/>
Feelings of disgust about meat/some types of meat (4)	<input type="radio"/>	<input type="radio"/>
Health (5)	<input type="radio"/>	<input type="radio"/>
Religious/spiritual beliefs (6)	<input type="radio"/>	<input type="radio"/>
Social influence (from friends, family, significant other, etc.) (7)	<input type="radio"/>	<input type="radio"/>
Social justice or world hunger (8)	<input type="radio"/>	<input type="radio"/>
Taste preferences (9)	<input type="radio"/>	<input type="radio"/>
Wanting to follow a food trend (10)	<input type="radio"/>	<input type="radio"/>

Notes:

- *Matrix table, Likert, single answer*
- *Mobile friendly*
- *Force response*

rVEGWILLING

How willing, if at all, are you to adopt a vegetarian diet (one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats)?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)
- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

rREDUCEFURTHER

How willing, if at all, are you to further reduce the total amount of meat you eat (compared to your current level of consumption)?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)
- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

rGUILT

To what extent do you agree or disagree with the following statement: Even small reductions of meat have an impact so I do not feel guilty that I am not reducing more.

- ☐ Strongly disagree (1)
- ☐ Disagree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Agree (4)
- ☐ Strongly agree (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

rCONFLICTED

How conflicted, if at all, are you because you feel there are problems with meat but still consume it?

- ☐ Not at all conflicted (1)
- ☐ Slightly conflicted (2)
- ☐ Moderately conflicted (3)
- ☐ Very conflicted (4)
- ☐ Extremely conflicted (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

rCOMPARISON

In comparison to a vegetarian diet (one that excludes beef, pork, chicken, turkey, fish, shellfish, and other meats), I suspect being on a reduced-meat diet is in general...

- ☐ Much worse (1)
- ☐ Somewhat worse (2)
- ☐ About the same (3)
- ☐ Somewhat better (4)
- ☐ Much better (5)
- ☐ Don't know (6)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

rMOTIVATIONS

Which of the following motivates you to eat a reduced-meat diet?

	Yes (1)	No (2)
Animal protection (1)	<input type="radio"/>	<input type="radio"/>
Concern for the environment (2)	<input type="radio"/>	<input type="radio"/>

Cost (3)	<input type="radio"/>	<input type="radio"/>
Feelings of disgust about meat/some types of meat (4)	<input type="radio"/>	<input type="radio"/>
Health (5)	<input type="radio"/>	<input type="radio"/>
Religious/spiritual beliefs (6)	<input type="radio"/>	<input type="radio"/>
Social influence (from friends, family, significant other, etc.) (7)	<input type="radio"/>	<input type="radio"/>
Social justice or world hunger (8)	<input type="radio"/>	<input type="radio"/>
Taste preferences (9)	<input type="radio"/>	<input type="radio"/>
Wanting to follow a food trend (10)	<input type="radio"/>	<input type="radio"/>

Notes:

- *Matrix table, Likert, single answer*
- *Mobile friendly*
- *Force response*

vMOTIVATIONS

Which of the following motivates you to eat a vegetarian/vegan diet?

	Yes (1)	No (2)
Animal protection (1)	<input type="radio"/>	<input type="radio"/>
Concern for the environment (2)	<input type="radio"/>	<input type="radio"/>
Cost (3)	<input type="radio"/>	<input type="radio"/>
Feelings of disgust about meat/some types of meat (4)	<input type="radio"/>	<input type="radio"/>
Health (5)	<input type="radio"/>	<input type="radio"/>
Religious/spiritual beliefs (6)	<input type="radio"/>	<input type="radio"/>
Social influence (from friends, family, significant other, etc.) (7)	<input type="radio"/>	<input type="radio"/>
Social justice or world hunger (8)	<input type="radio"/>	<input type="radio"/>
Taste preferences (9)	<input type="radio"/>	<input type="radio"/>
Wanting to follow a food trend (10)	<input type="radio"/>	<input type="radio"/>

Notes:

- *Matrix table, Likert, single answer*
- *Mobile friendly*
- *Force response*

ocMOTIVATIONS

Which of the following would motivate you to eat a chicken-free diet?

	Yes (1)	No (2)
Animal protection (1)	<input type="radio"/>	<input type="radio"/>

Concern for the environment (2)	<input type="radio"/>	<input type="radio"/>
Cost (3)	<input type="radio"/>	<input type="radio"/>
Feelings of disgust about meat/some types of meat (4)	<input type="radio"/>	<input type="radio"/>
Health (5)	<input type="radio"/>	<input type="radio"/>
Religious/spiritual beliefs (6)	<input type="radio"/>	<input type="radio"/>
Social influence (from friends, family, significant other, etc.) (7)	<input type="radio"/>	<input type="radio"/>
Social justice or world hunger (8)	<input type="radio"/>	<input type="radio"/>
Taste preferences (9)	<input type="radio"/>	<input type="radio"/>
Wanting to follow a food trend (10)	<input type="radio"/>	<input type="radio"/>

Notes:

- *Matrix table, Likert, single answer*
- *Mobile friendly*
- *Force response*

orFAVORITEFOODS

In light of the fact that it is possible to reduce your meat consumption and still have your favorite meat-based dishes, how willing, if at all, are you to adopt a reduced-meat diet?

- ☐ Not willing (1)
- ☐ Likely not willing (2)
- ☐ Unsure (3)
- ☐ Likely willing (4)
- ☐ Willing (5)

Notes:

- *Multiple choice, single answer*
- *Horizontal*
- *Label position above*
- *Force response*

orALLORNOTHING

To what extent do you agree or disagree with the following statement: If I am unable to give up all meat, I'm unlikely to give up some meat—it is all or nothing for me.

- ☐ Strongly disagree (1)
- ☐ Disagree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Agree (4)
- ☐ Strongly agree (5)

Notes:

- Multiple choice, single answer
- Horizontal
- Label position above
- Force response

or MOTIVATIONS

Which of the following would motivate you to eat a reduced-meat diet?

	Yes (1)	No (2)
Animal protection (1)	<input type="radio"/>	<input type="radio"/>
Concern for the environment (2)	<input type="radio"/>	<input type="radio"/>
Cost (3)	<input type="radio"/>	<input type="radio"/>
Feelings of disgust about meat/some types of meat (4)	<input type="radio"/>	<input type="radio"/>
Health (5)	<input type="radio"/>	<input type="radio"/>
Religious/spiritual beliefs (6)	<input type="radio"/>	<input type="radio"/>
Social influence (from friends, family, significant other, etc.) (7)	<input type="radio"/>	<input type="radio"/>
Social justice or world hunger (8)	<input type="radio"/>	<input type="radio"/>
Taste preferences (9)	<input type="radio"/>	<input type="radio"/>
Wanting to follow a food trend (10)	<input type="radio"/>	<input type="radio"/>

Notes:

- Matrix table, Likert, single answer
- Mobile friendly
- Force response

or MOTIVATIONS

Which of the following would motivate you to eat a vegetarian diet?

	Yes (1)	No (2)
Animal protection (1)	<input type="radio"/>	<input type="radio"/>
Concern for the environment (2)	<input type="radio"/>	<input type="radio"/>
Cost (3)	<input type="radio"/>	<input type="radio"/>
Feelings of disgust about meat/some types of meat (4)	<input type="radio"/>	<input type="radio"/>
Health (5)	<input type="radio"/>	<input type="radio"/>
Religious/spiritual beliefs (6)	<input type="radio"/>	<input type="radio"/>
Social influence (from friends, family, significant other, etc.) (7)	<input type="radio"/>	<input type="radio"/>
Social justice or world hunger (8)	<input type="radio"/>	<input type="radio"/>
Taste preferences (9)	<input type="radio"/>	<input type="radio"/>

Wanting to follow a food trend (10)	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------

Notes:

- *Matrix table, Likert, single answer*
- *Mobile friendly*
- *Force response*

ZIPCODE

What is your zip code?

Notes:

- *Text entry, single line*
- *Force response*
- *Content validation, US Postal Code*

FEEDBACK

Any final feedback?

Notes:

- *Text entry, multi line*
- *Force response*

CURRICULUM VITAE

Candidate's full name

Kathryn Elizabeth Asher

Universities attended

York University, 2006, Master in Environmental Studies

St. Thomas University, 2003, Bachelor of Arts (Human Rights and Political Science)

Publications

- Asher, K., & Cherry, E. (2016). "Hogar es donde está la comida: barreras al vegetarianismo y veganismo en el ámbito doméstico." This is a Spanish translation of the article "Home is where the food is: Barriers to vegetarianism and veganism in the domestic sphere," which appeared in the journal *Revista Latinoamericana de Estudios Críticos Animales*.
- Asher, K., Green, C., Peake, C., Jewell, M., Gutbrod, H., Hale, G., & Bastian, B. (2016). *Study of current and former vegetarians and vegans: Secondary findings*. Olympia, WA: Faunalytics.
- Peake, C., Asher, K., & Green, C. (2016). *Study of current and former vegetarians and vegans: Companion to the secondary findings*. Olympia, WA: Faunalytics.
- Ganesan, R., Asher, K., & Green, C. (2016). *A study of the motivations and barriers to participation in The Save Movement*. Olympia, WA: Faunalytics.
- Asher, K., & Cherry, E. (2015). Home is where the food is: Barriers to vegetarianism and veganism in the domestic sphere. *Journal for Critical Animal Studies*, 13(1), 66–91.
- Asher, K., Green, C., Ganesan, R., & Peake, C. (2015). *Creating change online: A study of The Save Movement's social media presence*. Olympia, WA: Faunalytics.
- Asher, K., Green, C., deLespinasse, C., Gutbrod, H., Bastian, B., Jewell, M., & Hale, G. (2015). *Study of current and former vegetarians and vegans: Qualitative findings*. Olympia, WA: Faunalytics.
- Asher, K. (2014). Review: We Animals (2013). *Journal for Critical Animal Studies*, 12(3), 122–129.
- Asher, K., Green, C., Gutbrod, H., Jewell, M., Hale, G., & Bastian, B. (2014). *Study of current and former vegetarians and vegans: Initial findings*. Olympia, WA: Faunalytics.
- Asher, K., Green, C., Gutbrod, H., Jewell, M., Hale, G., & Bastian, B. (2014). *Study of current and former vegetarians and vegans: Companion to the initial findings*. Olympia, WA: Faunalytics.
- Armstrong, P., Asher, K., Calhoun, S., & Ross, T. (2012). *Experiencing homelessness: In Saint John and New Brunswick*. Saint John, NB: Human Development Council.
- Asher, K. (2012). *Video outreach assessment tool*. Glendale, CA: VegFund.
- Asher, K. (2011). *PUMP UP! Power Up Mentorship Program: Urban Project! Evaluation*. Saint John, NB: Human Development Council. Submitted to the Women's Issues Branch, Executive Council Office, Government of New Brunswick.

- Asher, K., Barry, J., Beckett, A., Harriman, J., Hatfield, R., MacDonald, D., Marquis, G., Quinn, H., & Mudge, S. (2011). *Greater Saint John's Vital Signs 2011: Our region's 6th annual check-up*. Saint John, NB: The Greater Saint John Community Foundation.
- Asher, K., & Hatfield, R. (2011). *New Brunswick child poverty report card*. Saint John, NB: Human Development Council, and Toronto, ON: Campaign 2000. (Also available in French: *N.-B. Rapport sur la pauvreté des enfants 2011*).
- Asher, K. (2010). *Developing the rural reach, will a Dodging Diabetes peer leader community learning model work? Evaluation*. Saint John, NB: Human Development Council. Submitted to the Public Health Agency of Canada.
- Asher, K. (2010). *Dodging Diabetes in the Old North End: Evaluation*. Saint John, NB: Human Development Council. Submitted to the Public Health Agency of Canada.
- Asher, K. (2010). *Learn & Go II: Evaluation*. Saint John, NB: Human Development Council.
- Asher, K. (2010). *New Brunswick child poverty report card*. Saint John, NB: Human Development Council, and Toronto, ON: Campaign 2000. (Also available in French: *N.-B. Rapport sur la pauvreté des enfants 2010*).
- Asher, K. (2010). *Youth Engagement Project: Evaluation*. Saint John, NB: Human Development Council.
- Asher, K., Barry, J., Bogle, S., Hatfield, R., Marquis, G., Mudge, S., Reeves, P., & Robertson, C. (2010). *Greater Saint John's Vital Signs 2010: Our region's annual check-up*. Saint John, NB: The Greater Saint John Community Foundation.
- Asher, K. (2009). *Community voices talking diabetes, Dodging Diabetes via peer development in two low-income neighborhoods*. Saint John, NB: Human Development Council. Submitted to the Public Health Agency of Canada.
- Asher, K. (2009). *Learn & Go: Evaluation*. Saint John, NB: Human Development Council.
- Asher, K. (2009). *Strengthening pathways to education for youth at risk in Saint John: A discussion paper*. Saint John, NB: Human Development Council.
- Asher, K. (2008). *Poverty and plenty II: A statistical snapshot of the quality of life in Saint John*. Saint John, NB: Vibrant Communities Saint John.
- Asher, K. (2008). *VCSJ neighbourhood assistant evaluation*. Saint John, NB: Vibrant Communities Saint John. Submitted to the City of Saint John.
- Asher, K. (2007). *Youth homelessness in Saint John*. Saint John, NB: Human Development Council. Submitted to Human Resources and Skills Development Canada.
- Asher, K. (2006). *An ICC recommendation comes to life: The municipal youth cabinet's role in inclusion*. A Policy and Practice Paper, series editor Christa Freiler. Saint John, NB: Inclusive Cities Canada and Human Development Council. Submitted to the Inclusive Cities Canada Project Team and Human Resources and Skills Development Canada.
- Asher, K. (2005). *Affordable housing handbook: Connecting providers with programs in the Saint John area*. Saint John, NB: Human Development Council.
- Asher, K. (2005). *Bringing youth to the table, a Saint John youth cabinet*. Saint John, NB: Human Development Council.

Asher, K. (2005). *Revisiting the abolition/reform debate in the animal activism movement with an efficacy assessment model*. (Master in Environmental Studies thesis, York University).

Asher, K. (2004). *Staying afloat: The health of the nonprofit and voluntary sector in the Saint John NB area*. Saint John, NB: Human Development Council.

Conference Presentations

Asher, K. (2017, April). *Go Whole Hog? The function of diet choice, perception, and experience on meat consumption in America* [poster presentation]. New York Chapter of the American Association for Public Opinion Research (NYAAPOR) Young Scholars Evening, Fordham University, New York, NY.

Asher, K. (2016, August). *Vegetarianism and veganism in America: Measuring and understanding meat-free eating* [poster presentation]. American Sociological Association Annual Meeting, Seattle, WA.

Asher, K. (2016, August). Seen and unseen: The role of visibility in humans' use of nonhuman animals [session organizer and presider]. American Sociological Association Annual Meeting, Seattle, WA.

Asher, K. (2015, September). *Meatless diets in the U.S.: Understanding who and why* [poster presentation]. UNB Research Showcase, UNB, Fredericton, NB.

Asher, K. (2015, April). *Veg recidivism: Quantifying and understanding lapses from vegetarian and vegan diets in the U.S.* [poster presentation]. Graduate Research Conference, UNB, Fredericton, NB.

Asher, K. (2013, April). *Eat this: Exploring the effects of online dietary behaviour change mobilization in the animal protection movement* [poster presentation]. Graduate Research Conference, UNB, Fredericton, NB.