Eating for wellness: Development, analysis, comparison and discussion of meal plans based on the Mediterranean and vegetarian dietary patterns

Anastasia Economou

Introduction

Obesity has become a world-wide epidemic with three billion people being overweight (World Health Organisation, 2014). The solution offered is dieting, with different experts advocating different diets. However, it has been observed over time that diets may work for losing some weight initially but not in the long term or, they might work for some individuals but not others. This points to the multifactorial influence (genetic, biological, epigenetic) on weight loss and management, and therefore the approach should be individualised – one size does not fit all (Smethers and Rolls, 2018). In this report, an individualised approach is taken for a hypothetical client, Claudia, who is a 38 years old female in good health who wants to lose weight. She will be offered diet plans based on the Mediterranean diet (MedDiet) and the Vegetarian diet (VEG) according to Eat Well Guide (EWG) so she can choose which diet plan meets best her needs. The diet plans were put through the Nutritics software for further analysis of composition and comparison (see Appendix). It is important that there is a balanced intake of the main nutrients i.e. carbohydrates, proteins and fats, which the report further discusses alongside the two diet plans.

Methods

In the last 50 years there have been a plethora of diets. Their popularity has often stemmed from the financial interests of those involved in their conception and promotion rather than health benefits (Boome, 2013; Curry, 2013; Radford, 2013; Sheahan, 2013). The expansion of social media has encouraged 'fad' diets (Quinn, 2017). Fad diets like juicing/detoxification are restrictive and not sustainable, intermittent fasting can lead to binge eating on non-fasting days, while the paleo diet can lead to low calcium (Obert, Pearlman, Obert & Chapin, 2017). Named diets (e.g. Weight Watchers, Atkins, South Beach, Zone) were also found to lead to minimal weight loss (Atallah et al., 2015; Johnston et al., 2014).

The MedDiet has been popular due to its health benefits in relation to cardiovascular diseases (CVD) (Martínez-González et al., 2015), cognitive health (Davis, Bryan, Hodgson & Murphy, 2015) and glycaemic control for individuals with type 2 diabetes (Mancini, Filion, Atallah & Eisenberg, 2015). The MedDiet originated in the 'Seven Countries Study' in the 1960s (<https://www.sevencountriesstudy.com/about-the-study/>). It included consumption of extra-virgin olive oil, large quantities of vegetables, fruits, pulses, nuts, cereals and small quantities of fish, meat, red wine and dairy products with restriction on the amounts of sweets and eggs. Over the years, although the food elements of the MedDiet have not changed, the quantities recommended differ across different studies (Davis et al., 2015).

Mancini et al. (2015) found that the MedDiet led to a larger weight loss than the low-fat diets but similar to low-carbohydrate diets and the American Diabetes Association diet. It has been observed that the collection of healthy nutrients in the MedDiet as a whole leads to beneficial outcomes (Widmer, Flammer, Lerman & Lerman, 2015) which can be maintained.

Vegetarian diets (exclude meat and fish but can be vegan or lacto-ovo vegetarian) have beneficial outcomes on type 2 diabetes (Mamluk et al., 2017; Tonstad et al., 2013; Willey, Wakefield & Silver, 2020), CVDs and BMI (Crowe, Appleby, Travis & Key, 2013; Pettersen, Anousheh, Fan, Jaceldo-Siegl & Fraser, 2012) which can be maintained (Pettersen et al., 2012).

Huang, Huang, Hu & Chavarro (2012) found that vegetarians lost 2 kilos more when compared to non-vegetarians. Also, those in vegan diets lost more weight than those on lacto-ovo vegetarian diets. The effects were found to progressively diminish after one year. The adherence to the diets varied from 51% to 83%.

VEG EWG has been criticized for encouraging the consumption of too much starch and promoting interests of the food industry (Dillon, 2018a, 2018b).

MedDiet and VEG EWG both benefit from being rich in fibre and include small quantities of energy-dense foods which contributes to satiety and better adherence and maintenance of weight loss (Davis et al., 2015; Ello-Martin, Roe, Ledikwe, Beach & Rolls, 2007; Huang et al., 2012; Sacks et al., 2009).

It is important for Claudia's health and quality of life to follow a diet that is balanced and suits her needs (does not enjoy cooking, works and gets tired, is interested in sustainability). The MedDiet, based on the Fundación Dieta Mediterránea pyramid (https://dietamediterranea.com/piramidedm/piramide_INGLES.pdf), and the VEG diet, based on the EWG of Public Health England (National Health System [NHS], 2020a) - also advised by the Vegetarian Society (<https://vegsoc.org/info-hub/health-and-nutrition/vegetarianeatwellguide/>) - will be suggested to her (see Table 1, p.5).

The meal plans for both diets focused on carbohydrates, protein and fats due to their nutritional importance for health.

Carbohydrates are the most important source of energy for the body. There are three different types: sugar (free sugars not to exceed 5% of the daily intake), starch (not to exceed one third of the daily intake) and fibre (30g/d) (The Scientific Advisory Committee on Nutrition [SACN] 2015a, 2015b). Carbohydrates rich in fibre can lead to a feeling of fullness and as a result reduced energy consumption (Wanders et al, 2011, Dahl et al, 2015, Slavin, 2005).

Carbohydrates are also rich in vitamins and minerals. They are essential for the functioning of body and have positive effects on health including gastrointestinal, type 2 diabetes, CVD and metabolism of sugars (NHS, 2020b; British Nutrition Foundation [BNF] 2020a) when consumption of a variety of carbohydrates is encouraged (SACN, 2015a).

Table 1 - Comparison of the Mediterranean Diet and the Vegetarian Eat Well Guide diet plan

	Mediterranean Diet – portions based on the MedDiet Pyramid (https://dietamediterranea.com/piramidedm/piramide_INGLES.pdf)	Vegetarian Eat Well Guide – Portions (NHS, 2020a)
Starch Bread/pasta/rice/couscous /cereals/potatoes	1-2 per meal (3-6 x day) NB: Potatoes ≤3 x wk	3-4 x day
Veg & Fruit	Veg: ≥2 x main meal (≥6 x day) Fruit: 1-2 x main meal (3-6 x day) Total Veg & Fruit x day: ≥9 or ≥12 (the additional being veg)	Veg & Fruit: ≥5 x day
Dairy	2 x day	2-3 x day
Nuts/seeds/ olives	1-2 x day	Nuts/seeds/ Eggs/pulses/ tofu/vegmeat alternatives 2-3 x day
Pulses	≥2 weekly	
Eggs	<u>2-4 weekly</u>	
Fish	≥2 weekly	-
White meat	2 x wk	-
Red Meat	≤2 weekly NB: Processed ≤1	-
If we group together Nuts/seeds/ olives, Pulses, Eggs, Fish, White meat, red meat (veg meat alternatives for the Vegetarian Eat Well Guide plan):	≥14 portions per week i.e. ≥2 portions of these foods per day NB: of course, we use max portions x day recommended per type of food - see above	2-3 x day
Olive oil	per meal, does not specify serving	Small amounts of Oils and unsaturated fats
Sweets	≤2 weekly	Small quantities/5% free sugars x day
6-8 glasses of liquids i.e. water and herbal infusions		

Protein is essential for development, energy and maintenance of health. Its building blocks are amino acids and they are found in animal products (the full range) and plants (from a combination of plant sources) (BNF, 2020b). Consumption of protein seems to contribute to the feeling of fullness and satisfaction more than any other macronutrients. Fullness ratings were found to be higher following higher consumption of protein when compared to lower consumption of protein (Dhillon et al., 2016; Leidy et al., 2015).

Fat is the most energy-dense nutrient (1g=9kcal) and it should be consumed in small amounts. Its building blocks are fatty acids - these are divided into saturated, monounsaturated and polyunsaturated with the saturated fats being the least healthy (BNF, 2020c; Smethers and Rolls, 2018; Tobias et al., 2015). Fats play an important role in regulating food intake, hunger, satiety, metabolic processes and utilising energy; signals in the brain's reward system may be activated directly as soon as fat arrives in the mouth (Smilowitz et al., 2010). 3-polyunsaturated fats can lead to positive changes in the gut microbiota of obese people (Gonçalves, Galvão & de Cássia, 2019).

In order to develop the meal plans the Nutritics software (v5.5) was used (<https://www.nutritics.com/>) with the HENRY 2005 formula. The UK SACN dietary reference values (DRVs) were followed [50% for carbohydrates; ≤ 5% free sugars (i.e. added sugars); ≤35% fats (of which saturated ≤10%); 15% for protein]. (SACN, 2015a; SACN, 2015b; SACN, 2019).

The meal plans were developed considering sustainability of the foods recommended. Most of the foods can be found locally or produced in the UK; olive oil, some fruits and nuts are imported and they should be fair trade or organic. This approach supports biodiversity while benefiting health (Torp Austvollm, Gallo & Montag, 2020).

Results

On the basis of her age, weight, height and physical activity Claudia should consume 1800 kcal per day in order to reach her desirable weight in a sustainable and healthy manner. The meal plans (see Appendix, p.26) show that the DRV for Carbohydrates is a little higher in VEG (47.62%) when compared to MedDiet (45.56%) – with both being closed to the SACN recommendations. The DRV for protein is higher in MedDiet (23%), than in VEG (20%) with both being higher than the SACN recommendation. The DRV for fat is on the higher end but within SACN recommendations and similar for both diets (31.3% for MedDiet and 31.8% for VEG); the DRV for saturated fat (6.34% for MedDiet and 7.1% for VEG) is also within the SACN recommendations (for MedDiet and VEG 5 days plan see Tables 2 and 3, p.8, for the comparisons see Tables 4 and 5, p.9).

Table 2 - Macronutrient Analysis – VEG Eat Well Guide Plan (for Claudia's 5 days plan)

	Kcal/ day	CHO	Protein	Fat	Saturat ed Fat	CHO – DRV	Protein – DRV	Fat – DRV	Saturat ed
Day 1	1794	876	380 (95.1g)	538	143 (15.9g)	48.8%	21.2%	30%	8%
Day 2	1794	857	374 (93.4g)	564	72 (8g)	47.8%	20.8%	31.4%	4%
Day 3	1799	859	358 (89.6g)	582	137 (15.3g)	47.7%	19.9%	32.3%	7.6%
Day 4	1796	831	363 (90.9g)	602	150 (16.6g)	46.3%	20.2%	33.5%	8.3%
Day 5	1796	854	370 (92.6g)	572	136 (15.1)	47.5%	20.6%	31.9%	7.6%
(Average of the 5 day meals)	1796	856	369 (92.26g)	572	128 (14.1g)	47.62%	20.54%	31.82%	7.1%

Table 3 - Macronutrient Analysis – Mediterranean Plan (for Claudia's 5 days plan)

	Kcal/ day	Total CHO	Protein	Fat	Saturat ed Fat	CHO- DRV	Protein – DRV	Fat- DRV	Saturat ed fat DRV
Day 1	1798	784	521 (130.3g)	493	86 (9.5g)	43.6%	29%	27.4%	4.8%
Day 2	1802	820	396 (92.2g)	613	142 (15.8g)	45.5%	20.5%	34%	7.9%
Day 3	1798	845	324 (80.9g)	629	122 (13.5g)	47%	18%	35%	6.8%
Day 4	1791	808	468 (116.9g)	515	108 (12g)	45.1%	26.1	28.8%	6%
Day 5	1800	838	394 (98.5g)	568	111 (12.4g)	46.6%	21.9%	31.6%	6.2%
(Average of 5 days plan)	1798	819	420 (103.7g)	563	114 (12.64g)	45.56%	23%	31.36%	6.34%

Table 4 - Macronutrient Analysis – Comparison of the 5 days Mediterranean and Vegetarian Eat Well meal plans for Claudia and the SACN recommendations

	Kcal/ day	CHO	Protein	Fat	Saturat ed Fat	CHO DRV	Protein DRV	Fat DRV	Saturat ed fat DRV	Sustain ability
MedDiet PLAN (5 days average)	1798	819	420 (103.7g)	563	114 (12.64g)	45.56%	23%	31.3%	6.34%	Mostly
VEG PLAN (5 day average)	1796	856	369 (92.26g)	572	128 (14.1g)	47.62%	20.54%	31.8%	7.1%	Mostly
SACN Recommendations						Approximately 50%	15%	≤35%	≤10%	Not addressed

Table 5 - Comparing DRVs according to SACN, and general recommendations for MedDiet and VEG EWG)

	CHO DRV	Protein DRV	Fat DRV	Saturat ed fat DRV	Sustain ability
MedDiet DRVs (Skinner, R. 2020)	45 - 50%	20%	30-35%	Aims to be reach in monounsaturated and polyunsaturated	Addressed by sourcing food locally and seasonally
VEG diet (NHS, 2020)	Approximately 50%	15%	≤35%	≤10%	Eat sustainable food (often part of the motivation and ideology behind those who want to adopt it)
SACN Recommendations (2015a,b; 2019)	Approximately 50%	15%	≤35%	≤10%	Not addressed

Discussion

The difference between the DRVs for protein in the meal plans produced and the DRVs recommended by SACN could be addressed by reducing the protein intake in both diet plans (to approximately 60g/d) and replacing it with carbohydrates - this will bring them much closer to the SACN recommendations (SACN 2015a and 2015b; SACN 2019). Or, it can be left as is for the VEG plan and reduce it around 90g/d for the MedDiet plan; according to Leidy et al., (2015) 75g-90g protein per day leads to satisfaction, fullness, weight and health management. Both diets include lean protein (e.g. low fat dairy products, pulses and chicken) as recommended by Smethers and Rolls (2018) as well as plant protein (more so in the VEG) which may be more beneficial for health and for promoting weight loss than animal protein (Kim et al., 2016; Lin et al., 2015; Medawar et al., 2020; Ruscica et al., 2018).

Fat in Claudia's plans was on the higher end of the SACN DRVs. Weight loss can take place with consumption of fats at the higher and lower recommended allowance. The use of polyunsaturated and monounsaturated fats, like in Claudia's diet plans, can contribute to the quality of diet and better health outcomes (Smethers and Rolls, 2018, Tobias et al., 2015). Moderately high-fat MedDiet has been found to be protective for CVD (Beulen et.al., 2018) as has MedDiet with no restriction of fat and high adherence (Bloomfield et al., 2016). Dietary fat with DRV $\leq 30\%$ was linked to a small, but statistically significant decrease in body weight (Hooper et al., 2012).

Success in weight loss in the vegetarian diets is attributed to the fruit, vegetable and wholegrains consumed and the presence of fibre (Huang et al., 2012) - all included in the VEG plans. Consumption of pasta has also been found to support weight loss and management when taken as part of high carbohydrate dietary patterns (Chiavaroli et al., 2018).

Both plans encourage a consistent intake pattern with most daily intake covered by breakfast and lunch which may contribute to weight loss and maintenance (Hill, Thompson & Wyatt, 2005; Kant, Anton, Angelopoulos & Rippe, 2008; Wing & Phelan, 2005; Yannakoulia, Poulilmenas, Mamalaki & Anastasiou, 2019).

Both diets were planned considering sustainability. We live in a world where many people are still undernourished and global efforts have focused on providing nutritious food that consists of macro- and micro-nutrients for all people (Godfray et al., 2010; World Bank, 2012; World Food Summit, 1996;). However, increasing production alone is not sufficient (Global Nutrition Report, 2020); diverse and multi-functional agricultural systems (e.g. small and/or organic farms) using less machinery (and fossil fuels) and less agrochemicals reduce the environmental footprint and can offer nutrition benefits (The Open University, 2019). Therefore, sourcing fair-trade foods grown locally, organically, and on small farms, can support multi-functional agricultural systems and promote sustainability.

Claudia's adherence to her chosen diet is essential to achieve her goals. Adherence has been found to play a very important role in weight loss (Clifton, Kondo & Keogh, 2014; Leidy et al., 2015; Romieu et al., 2017; Smethers and Rolls, 2018; Thorn and Lean, 2017; Yannakoulia et al., 2019). Satiety has been identified

as contributing to adherence. Fibre and protein, included in Claudia's plans, can lead to a feeling of fullness as can the order in which foods are consumed. Palatability of food (is addressed in the plans with the use of spices, herbs and oils rich in polyunsaturated and monounsaturated fats), practical advice and help with strategies can also be useful (Smethers and Rolls, 2018). The plans also are close to Claudia's culture and ideology so this should further add to her adherence (Yannakoulia et al., 2019). Inclusion of physical activity (and in particular aerobic and resistance exercise) seems to have the best outcome in weight loss (Romieu et al., 2017) while the use of behavioural therapy can also be supportive (Mancini et al., 2015).

Conclusion

There is no perfect diet neither is there an ideal composition of macronutrients. Reduction in calorific intake can lead to weight loss irrespective of the macronutrient emphasised in the respective dietary pattern (Ge et al., 2020; Mancini et al., 2015; Sacks et al., 2009; Yannakoulia et al., 2019). Fad and over-restrictive diets can have adverse health effects. The Mediterranean and vegetarian diets have been found beneficial for health and weight loss while meeting nutritional requirements. In this report MedDiet and VEG EWG overall met the recommended DRVs while some small adjustments could still be made in relation to protein. Adherence plays a very important role and the factors that impact on it, including culture and ideology (e.g. sustainability), should be taken into consideration when making a diet plan. Weight loss plans and goals need to

be reasonable and individualised, meeting the needs of the individual in order to have successful outcomes. More research for MedDiet and vegetarian diets (including EWG) with randomised trials aiming at weight loss and long-term weight maintenance is needed.

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APPENDIX

MEAL PLANS

Meal Plans exported from Nutritics (used the UK SACN 2017 DRV: 35% max Fat; 13.3% Protein; 52% Carbohydrates) x CLAUDIA (38yrs old; 80kg, 163cm, 30.1BMI, Nutritics v5.5- with UK SACN 2017 DRVs and HENRY 2005 formula)

INSTRUCTIONS – apply to both diets: Aim for 6-8 glasses of liquids (i.e. water and herbal infusions) every day. Where ever possible, aim to buy milk, red meat, white meat, vegetables and fruits from local markets/ farms; look for sustainably sourced fish and fair trade or organic products.

MEDITERRANEAN 5 DAYS MEAL PLANS (MedDiet) -

MedDiet - Day 1						
Food Name	Quantity	Measure	Energy(Kcal)	Carbohydrate	Protein	Fat
Day1 - Breakfast						
Apples eating raw flesh and skin	120	1x Small	63	13.8	0.72	0.6
Milk skimmed pasteurised average	250	1x cup / serving	88	11.5	8.8	0.75
Almonds with skin	20	2x Average Portion	117	1.4	4.2	10.5
Raisins	36	2x Average Portion	104	24.9	0.76	0.14
Oat flakes rolled	40	1x Serving 1/2 cup	149	25.7	4.4	3.2
		Meal Totals	522kcal	77g	18.8g	15.2g

Day1 - Lunch						
Beetroot raw	160	2x beet	58	11.5	2.7	0.16
Oil olive	6.3	0x Each	57	0	trace >	6.3
Eggs chicken whole boiled	114	2x large egg	163	0	16.1	10.9
Bananas raw flesh only weighed with skin	127	1x Small (5")	68	16	1	0
Onions raw	30	2x slice or in sandwich/wrap	11	2.4	0.3	0.03
Mixed herbs dried	0.35	0.5x teaspoon	0.94	0.13	0.04	0.03
Carrots old raw	240	2x large carrot	108	19.2	2.4	2.4
Lettuce average raw	100	2x Medium portion	11.3	1.4	1.2	0.1
Bread wholemeal average	28	1x Thin sliced	60	10.7	2.6	0.7
		Meal Totals	537kcal	61g	26.4g	20.7g
Day1 - Dinner						
Apples eating raw flesh and skin	230	1x Large	122	26.5	1.4	1.2
Oil olive	12.6	1x tablespoon	113	0	0	12.6
Yogurt Greek plain low fat	200	1.3x Larger pot	112	6.8	20.4	0.4
Chicken breast grilled without skin meat only	160	1x large fillet	232	0	51	3
Parsley fresh	5	0.5x handful	1.7	0.14	0.15	0.07
Onions raw	15	1x slice or in sandwich/wrap	5.5	1.2	0.15	0.02
Fennel Florence raw	100	1.1x cup sliced	12.6	1.8	0.9	0.2
Peas frozen boiled in unsalted water	200	8x tablespoon	141	21	11	1.4
		Meal Totals	740kcal	57g	85g	18.9g
		Plan Total:	1798kcal	196g	130g	55g

Macronutrient Analysis – MedDiet– Day1

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	196.1g	143.2g	130.3g	54.8g	9.5g
g/kg body weight	2.5	1.6	1.6	0.7	0.1
Kilocal	784	573	521	493	86
Kilocal%	43.6%	31.9%	29%	27.4%	4.8%

MedDiet - Day 2						
Food Name	Quantity	Measure	Energy(Kcal)	Carbohydrate	Protein	Fat
Day 2 - Breakfast						
Mango Dried	24	4x Mango piece	83	19.2	0.88	0.25
Pears raw flesh and skin	115	1x small	52	12.4	0.35	0.12
Walnuts kernel only	20	1.3x Average Portion	138	0.62	2.9	13.7
Milk semi-skimmed pasteurised average	250	1x cup / serving	118	11.3	8.8	4.3
Weetabix Organic 24 Pack	40	1.1x Per 37.5g serving	135	28	4	0.8
		Meal Totals	526kcal	71g	16.9g	19.1g
Day 2 - Lunch						
Apples eating raw flesh and skin	230	1x Large	122	26.5	1.4	1.2
Oil olive	12.6	1x tablespoon	113	0	0	12.6
Essential Waitrose Black Eyed Beans in Water 400g	236	2x As Drained Per 1/2 Can	234	39.4	16.3	1.2
Cheese Feta	30	1x 5 1cm cubes	75	0.42	4.7	6.1
Balsamic Vinegar	1.9	0.5x teaspoon	1.3	0.32	0.01	0
Oregano dried ground	0.9	0.5x teaspoon	1.6	0.22	0.08	0.04
Cucumber raw flesh and skin	150	1x 1/4 average cucumber	21.3	1.8	1.5	0.9
Tomatoes cherry raw	140	1x cup	32.6	5	1.5	0.7
Bread brown average	28	1x Thin sliced	57	10.8	2.2	0.56
		Meal Totals	657kcal	84g	27.7g	23.2g
Day 2 - Dinner						
Yogurt Greek plain low fat	125	1x average pot	70	4.3	12.7	0.25

Couscous plain cooked	83	1x Average Portion	145	28.3	6	0.83
Melon Galia flesh only	260	2x slice	65	14.3	1.3	0.26
Lemon juice fresh	15	1x tablespoon	1.1	0.24	0.05	0
Broccoli green steamed	55	0.5x Large portion	19.2	1.9	2.3	0.28
Salmon wild steamed	100	1x average darne	206	0	25.3	11.6
Oil olive	12.6	1x tablespoon	113	0	0	12.6
		Meal Totals	619kcal	49g	48g	25.8g
		Plan Total:	1802kcal	205g	92g	68g

Macronutrient Analysis – MedDiet – Day 2

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	204.9	98.3	92.2	68.1	15.8
g/kg body weight	2.9	1.4	1.3	1	0.2
Kilocal	820	393	369	613	142
Kilocal%	45.5%	21.8%	20.5%	34%	7.9%

MedDiet - Day 3						
Food Name	Quantity	Measure	Energy (Kcal)	Carbohydrate	Protein	Fat
Day 3 -Breakfast						
Bananas raw flesh only weighed with skin	158	1x Medium (7")	85	19.9	1.3	0
Pecan nuts kernel only	20	1.3x Average Portion	138	1.1	1.8	14
Figs dried	50	2x Average portion	120	26.4	1.8	0.8
Wheat Flakes	42	1x 1/2 cup	117	23.4	4.5	0.59
Milk semi-skimmed pasteurised average	250	1x cup / serving	118	11.3	8.8	4.3
		Meal Totals	578kcal	82g	18.1g	19.7 g
Day 3 - Lunch						
Pitta bread wholemeal	35	1x Mini	91	18.5	3.2	0.42
Beans red kidney canned in water re-heated drained	150	1x cup	136	21.6	10.4	0.9
Oil olive	12.6	1x tablespoon	113	0	0	12.6
Tofu raw regular	250	1x cup	208	5	20.2	12
Coriander fresh raw	10	1x handful	1.8	0.12	0.21	0.05
Balsamic Vinegar	3.8	1x teaspoon	2.6	0.64	0.02	0
Apples eating raw flesh and skin	174	1x Medium	92	20	1	0.87
Fresh & Naked Big Mix Leaves Natural Leaves 90g	90	1x Per pack	16.7	1.5	1.4	0.54
		Meal Totals	661kcal	67g	36.5g	27.3 g
Day 3 - Dinner						

Peas raw	80	1x NHS serving = 3 tablespoons	67	8.5	5.5	1.2
Strawberries raw	160	1x cup halves	50	9.8	0.96	0.8
Coriander fresh raw	10	1x handful	1.8	0.12	0.21	0.05
Pine nuts kernel only	8	8x 10 nuts	55	0.3	1.1	5.5
Cheese Parmesan fresh	15	1x tablespoon	62	0.14	5.4	4.5
Balsamic Vinegar	3.8	1x teaspoon	2.6	0.64	0.02	0
Coriander fresh raw	10	1x handful	1.8	0.12	0.21	0.05
Celery raw	110	1x cup chopped	8.1	0.99	0.55	0.22
Broccoli green raw	92	1x Large portion	32.2	2.9	4	0.55
Pasta wholemeal dried	63	1x serving	203	38.4	8.4	1.8
Oil olive	8.4	2x teaspoon	76	0	trace >	8.4
		Meal Totals	559kcal	62g	26.3g	23g
		Plan Total:	1798kcal	211g	81g	70g

Macronutrient Analysis – MedDiet – Day 3

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	211.3	98.3	80.9	69.9	13.5
g/kg body weight	3	1.4	1.2	1	0.2
Kilocal	845	393	324	629	122
Kilocal%	47%	21.9%	18%	35%	6.8%

MedDiet - Day 4						
Food Name	Quantity	Measure	Energy (Kcal)	Carbohydrate	Protein	Fat
Day 4 -Breakfast						
Bananas raw flesh only weighed with skin	158	1x Medium (7")	85	19.9	1.3	0
Brazil nuts kernel only	20	4x average	137	0.58	2.9	13.6
Milk semi-skimmed pasteurised average	250	1x cup / serving	118	11.3	8.8	4.3
Apricots dried	32	1x Average Portion	63	13.7	1.5	0.22
Shredded Wheat	45	1x Per 45g (2 Biscuits) serving	151	30.2	5.4	0.99
		Meal Totals	554kcal	76g	19.8g	19.1g
Day 4 - Lunch						
Carrots old raw	67	1x NHS serving (1 medium carrot)	30.2	5.4	0.67	0.67
Cherries flesh and skin raw weighed with stones	154	2x Average Portion	64	14.6	1.1	0.15
Olives green in brine drained flesh and skin	35	1x 1/4 cup	35.9	0	0.32	3.9
Oil olive	12.6	1x tablespoon	113	0	0	12.6
Tuna canned in spring water drained	216	3x Small can (100g) drained	215	0	51	1.3
Oregano dried ground	1.8	1x teaspoon	3.1	0.44	0.16	0.08
Peppers capsicum yellow raw	160	1x medium pepper	37.4	7.4	1.3	0.32
Tomatoes cherry raw	140	1x cup	32.6	5	1.5	0.7
Cucumber raw flesh and skin	150	1x 1/4 average cucumber	21.3	1.8	1.5	0.9

Bread wholemeal average	56	2x Thin sliced	119	21.4	5.3	1.4
		Meal Totals	672kcal	56g	63g	22g
Day 4 - Dinner						
Mixed curry spices	1.9	1x teaspoon	5.2	0.48	0.25	0.25
Yogurt Greek plain low fat	90	2x tablespoon	51	3.1	9.2	0.18
Blueberries	144	6x Average Portion	60	13.1	1.3	0.29
Oil olive	12.6	1x tablespoon	113	0	0	12.6
Mr Organic Lentils 400g	400	1x Per pack	184	27.2	16	1.2
Beans green boiled in unsalted water	100	5x tablespoon	26.7	3.9	2.1	0.3
Asparagus boiled in unsalted water	84	1x Serving	22.2	1.2	2.9	0.67
Rice brown wholegrain boiled in unsalted water	80	1x Small portion	103	21.3	2.9	0.72
		Meal Totals	565kcal	70g	34.6g	16.2g
		Plan Total:	1791kcal	202g	117g	57g

Macronutrient Analysis – MedDiet – Day 4

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	201.9g	98.5g	116.9g	59.3	12g
g/kg body weight	2.9	1.4	1.7	0.8	0.2
Kilocal	808	394	468	515	108
Kilocal%	45.1%	22%	26.1	28.8%	6%

MedDiet - Day 5						
Food Name	Quantity	Measure	Energy (Kcal)	Carbohydrate	Protein	Fat
Day 5 - Breakfast						
Bananas raw flesh only weighed with skin	158	1x Medium (7")	85	19.9	1.3	0
Milk skimmed pasteurised average	250	1x cup / serving	88	11.5	8.8	0.75
Apples eating raw flesh and skin	174	1x Medium	92	20	1	0.87
Walnuts kernel only	20	1.3x Average Portion	138	0.62	2.9	13.7
Pineapple dried	32	1x Average Portion	92	21.2	0.8	0.42
Oat flakes rolled	40	1x Serving 1/2 cup	149	25.7	4.4	3.2
		Meal Totals	643kcal	99g	19.2g	19g
Day 5 - Lunch						
Grapes average	100	1x Small bunch	69	16.1	0.7	0.2
Oil olive	12.6	1x tablespoon	113	0	0	12.6
Turkey slices	168		191	2	38.6	3.2
Olives green in brine drained flesh and skin	35	1x 1/4 cup	35.9	0	0.32	3.9
Mixed Salad Leaves	108	3x cup	19.5	2.2	1.6	0.5
Sweetcorn kernels canned in water drained	120	1x Large portion	93	15.6	3.1	2
Bread wholemeal average	28	1x Thin sliced	60	10.7	2.6	0.7
		Meal Totals	582kcal	47g	47g	23.1 g
Day 5 - Dinner						

Oil olive	8.4	2x teaspoon	76	0	trace >	8.4
Beef minced stewed with onions extra lean	160	1x Large portion (1 Cup)	144	3.7	19.4	5.8
Blackberries raw	90	3x 6 blackberries	23.2	4.6	0.81	0.18
Mousse chocolate	70	1x Average Portion	105	13.3	2.8	4.6
Lemon juice fresh	15	1x tablespoon	1.1	0.24	0.05	0
Parsley fresh	10	1x handful	3.5	0.27	0.3	0.13
Lettuce Iceberg raw	100	2x Medium portion	13.1	1.9	0.7	0.3
Pasta wholewheat spaghetti dried boiled in unsalted water	160	1.3x Medium Portion	209	40	8.3	1.8
		Meal Totals	575kcal	64g	32.3g	21.1g
		Plan Total:	1800kcal	210g	98g	63g

Macronutrient Analysis – MedDiet – Day 5

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	209.5g	118.4g	98.5g	63.1g	12.4g
g/kg body weight	3	1.7	1.4	0.9	0.2
Kilocal	838	474	394	568	111
Kilocal%	46.6%	26.3%	21.9%	31.6%	6.2%

Macronutrient Analysis – Mediterranean Plan (for Claudia’s 5 days plan)

	Kcal/ day	Total CHO	Protein	Fat	Saturated Fat	CHO- DRV	Protein – DRV	Fat- DRV	Saturated fat DRV
Day 1	1798	784	521 (130.3g)	493	86 (9.5g)	43.6%	29%	27.4%	4.8%
Day 2	1802	820	396 (92.2g)	613	142 (15.8g)	45.5%	20.5%	34%	7.9%
Day 3	1798	845	324 (80.9g)	629	122 (13.5g)	47%	18%	35%	6.8%
Day 4	1791	808	468 (116.9g)	515	108 (12g)	45.1%	26.1	28.8%	6%
Day 5	1800	838	394 (98.5g)	568	111 (12.4g)	46.6%	21.9%	31.6%	6.2%
(Average of 5 days plan)	1798	819	420 (103.7g)	563	114 (12.64g)	45.56%	23%	31.36%	6.34%

VEGETARIAN PLAN (VEG) – based on Eat Well Guide, x 5 DAYS MEAL PLANS

VEG - Day 1						
Food Name	Quantity	Measure	Energy (Kcal)	Carbohydrate	Protein	Fat
Day 1 - Breakfast						
Bananas raw flesh only weighed with skin	127	1x Small (5")	68	16	1	0
Milk skimmed pasteurised average	250	1x cup / serving	88	11.5	8.8	0.75
Plums average raw flesh and skin	120	3x Small	46	10.4	0.72	0.12
Peanut butter wholegrain	20	1x tablespoon	121	1.4	5	10.6
Figs dried	30	1.2x Average portion	72	15.8	1.1	0.48
Bread wholemeal average	56	2x Thin sliced	119	21.4	5.3	1.4
		Meal Totals	514kcal	77g	21.8g	13.4 g
Day 1 - Lunch						
Pears raw flesh and skin	160	1x medium	72	17.3	0.48	0.16
Mixed beans canned drained	240	1x can (drained)	249	38.9	17.5	2.6
Oil olive	8.4	2x teaspoon	76	0	trace >	8.4
Cheese Cheddar English	30	1x Average grated portion (1/4 cup)	125	0.03	7.6	10.5

Balsamic Vinegar	3.8	1x teaspoon	2.6	0.64	0.02	0
Coriander fresh raw	10	1x handful	1.8	0.12	0.21	0.05
Sweetcorn kernels canned in water drained	66	1x NHS serving (3 heaped tablespoons)	51	8.6	1.7	1.1
Onions raw	15	1x slice or in sandwich/wrap	5.5	1.2	0.15	0.02
Celery raw	90	1x NHS Serving	6.7	0.81	0.45	0.18
Broccoli green raw	92	1x Large portion	32.2	2.9	4	0.55
		Meal Totals	621kcal	70g	32.1g	23.5g
Day 1 - Dinner						
Yogurt Greek plain low fat	125	1x average pot	70	4.3	12.7	0.25
Peas frozen boiled in unsalted water	116	2x Average Portion	82	12.2	6.4	0.81
Rice brown wholegrain boiled in unsalted water	120	1.5x Small portion	155	31.9	4.3	1.1
Strawberries raw	160	1x cup halves	50	9.8	0.96	0.8
Oil olive	8.4	2x teaspoon	76	0	trace >	8.4
Eggs chicken whole boiled	114	2x large egg	163	0	16.1	10.9
		Meal Totals	595kcal	58g	40g	22.3g
Day 1 - Mid-morning snack						
Apples eating raw flesh and skin	120	1x Small	63	13.8	0.72	0.6
		Meal Totals	63kcal	13.8g	0.72g	0.6g
		Plan Total:	1794kcal	219g	95g	60g

Macronutrient Analysis – VEG -Day 1

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	219g	118.7g	95.1g	59.7g	15.9g
g/kg body weight	3.1	1.7	1.4	0.9	0.2
Kilocal	876	475	380	538	143
Kilocal%	48.8%	26.5%	21.2%	30%	8%

VEG - Day 2						
Food Name	Quantity	Measure	Energy (Kcal)	Carbohydrate	Protein	Fat
Day 2 - Breakfast						
Milk skimmed pasteurised average	250	1x cup / serving	88	11.5	8.8	0.75
Raspberries raw	53	1x Average Portion	14.2	2.4	0.74	0.16
Pecan nuts kernel only	20	1.3x Average Portion	138	1.1	1.8	14
Apricots dried	64	2x Average Portion	126	27.4	3.1	0.45
Oat flakes rolled	40	1x Serving 1/2 cup	149	25.7	4.4	3.2
		Meal Totals	515kcal	68g	18.8g	18.6g
Day 2 - Lunch						
Beetroot raw	160	2x beet	58	11.5	2.7	0.16
Pitta bread wholemeal	35	1x Mini	91	18.5	3.2	0.42
Oil olive	12.6	1x tablespoon	113	0	0	12.6
Tofu raw regular	250	1x cup	208	5	20.2	12
Yogurt Greek plain low fat	150	1x Larger pot	84	5.1	15.3	0.3
Citrus orange fruit soft/easy peelers flesh only	120	2x medium	50	11.2	0.84	0.24
Balsamic Vinegar	3.8	1x teaspoon	2.6	0.64	0.02	0
Parsley fresh	10	1x handful	3.5	0.27	0.3	0.13
Yeast extract	9	1x level teaspoon	16.2	0.3	3.7	0.04
		Meal Totals	627kcal	52g	46g	25.8g
Day 2 - Dinner						
Yogurt Greek plain low fat	100	2.2x tablespoon	56	3.4	10.2	0.2
Blueberries	72	3x Average Portion	30.1	6.6	0.65	0.14
Quinoa red and white cooked	185	1x Medium Portion (1 cup)	192	32.2	8.7	3.1

Mixed Salad Leaves	108	3x cup	19.5	2.2	1.6	0.5
Peppers capsicum green raw	36	3x ring slice	5.9	0.94	0.29	0.11
Couscous plain cooked	83	1x Average Portion	145	28.3	6	0.83
Flaxseed oil	12.6	1x tablespoon	111	0	0	12.4
		Meal Totals	559kcal	74g	27.4g	17.3g
Day 2 - Mid-morning snack						
Apples eating raw flesh and skin	174	1x Medium	92	20	1	0.87
		Meal Totals	92kcal	20g	1g	0.87g
		Plan Total:	1794kcal	214g	93g	63g

Macronutrient Analysis – VEG -Day 2

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	214.2g	107g	93.4g	62.6g	8g
g/kg body weight	3.1	1.5	1.3	0.9	0.1
Kilocal	857	428	374	564	72
Kilocal%	47.8%	23.9%	20.8%	31.4%	4%

VEG - Day 3						
Food Name	Quantity	Measure	Energy (Kcal)	Carbohydrate	Protein	Fat
Day 3 - Breakfast						
Milk skimmed pasteurised average	250	1x cup / serving	88	11.5	8.8	0.75
Walnuts kernel only	20	1.3x Average Portion	138	0.62	2.9	13.7
Raisins	28.3	1x Sunmaid box (50 raisins)	82	19.6	0.59	0.11
Weetabix Organic	37.5	1x Per 37.5g serving	127	26.3	3.8	0.75
		Meal Totals	434kcal	58g	16g	15.3 g
Day 3 - Lunch						
Barley pearl boiled	180	1x Medium Portion (1 Cup)	210	45	4.9	1.1
Apricots raw flesh and skin	210	6x apricot	68	14.7	1.9	0.21
Flaxseed oil	4.2	1x teaspoon	37.1	0	0	4.1
Eggs chicken whole boiled	114	2x large egg	163	0	16.1	10.9
Cheese Cheddar English	30	1x Average grated portion (1/4 cup)	125	0.03	7.6	10.5
Watercress Spinach And Rocket 80G	80	1x Pack	24.7	2.6	2.7	0.4
		Meal Totals	628kcal	62g	33.2g	27.2 g
Day 3 - Dinner						
Yogurt Greek plain low fat	45	1x tablespoon	25.3	1.5	4.6	0.09

Oil olive	6.3	0x Each	57	0	trace >	6.3
Apples eating raw flesh and skin	174	1x Medium	92	20	1	0.87
Courgette boiled in unsalted water	40	1x Small portion	7.8	0.8	0.8	0.16
Asparagus boiled in unsalted water	84	1x Serving	22.2	1.2	2.9	0.67
Beans soya dried boiled in unsalted water	172	1x cup	242	8.3	24.1	12.6
Rice brown wholegrain boiled in unsalted water	160	1x Medium portion	206	43	5.8	1.4
		Meal Totals	653kcal	74g	39.1g	22.1g
Day 3 - Mid-morning snack						
Bananas raw flesh only weighed with skin	158	1x Medium (7")	85	19.9	1.3	0
		Meal Totals	85kcal	19.9g	1.3g	0g
		Plan Total:	1799kcal	215g	90g	65g

Macronutrient Analysis – VEG-Day 3

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	214.7g	93.2g	89.6g	64.6g	15.3g
g/kg body weight	3.1	1.3	1.3	0.9	0.2
Kilocal	859	373	358	582	137
Kilocal%	47.7%	20.7%	19.9%	32.3%	7.6%

VEG - Day 4						
Food Name	Quantity	Measure	Energy(Kcal)	Carbohydrate	Protein	Fat
Day 4 - Breakfast						
Bananas raw flesh only weighed with skin	158	1x Medium (7")	85	19.9	1.3	0
Almonds with skin	20	2x Average Portion	117	1.4	4.2	10.5
Milk skimmed pasteurised average	250	1x cup / serving	88	11.5	8.8	0.75
Mango Dried	30	5x Mango piece	103	24	1.1	0.32
Wheat Flakes	42	1x 1/2 cup	117	23.4	4.5	0.59
		Meal Totals	509kcal	80g	19.8g	12.2g
Day 4 - Lunch						
Cheese Feta	60	2x 5 1cm cubes	150	0.84	9.4	12.1
Thyme fresh	10	1x handful	9.5	1.5	0.3	0.25
Peaches raw flesh and skin	150	1x Large	52	11.1	1.5	0.15
Walnuts kernel only	15	1x Average Portion	103	0.47	2.2	10.3
Oil olive	8.4	2x teaspoon	76	0	trace >	8.4
Oregano dried ground	1.8	1x teaspoon	3.1	0.44	0.16	0.08
Cucumber raw flesh and skin	150	1x 1/4 average cucumber	21.3	1.8	1.5	0.9
Tomatoes cherry raw	140	1x cup	32.6	5	1.5	0.7
Yeast extract	7	1x Thick spread on bread	12.6	0.23	2.8	0.03

Pitta bread wholemeal	35	1x Mini	91	18.5	3.2	0.42
		Meal Totals	550kcal	39.9g	22.6g	33.3g
Day 4 - Dinner						
Yogurt Greek plain low fat	150	1x Larger pot	84	5.1	15.3	0.3
Essential Waitrose Chick Peas in Water 400g	120	1x As Drained Per 1/2 Can	131	19.8	9.2	1.7
Sausages vegetarian baked/grilled	84	2x sausage (Quorn)	151	7.5	12.5	7.9
Oil olive	8.4	2x teaspoon	76	0	trace >	8.4
Oranges flesh only	243	1x large/extra large fruit	90	19.4	1.9	0.49
Lemon juice fresh	15	1x tablespoon	1.1	0.24	0.05	0
Broccoli green steamed	110	1x Large portion	38.4	3.9	4.5	0.55
Curly kale raw	72	4x cup 1 inch pieces loosely packed	24.2	1	2.4	1.2
Potatoes new and salad boiled in unsalted water flesh and skin	80	1x large	50	10.9	1.4	0.08
		Meal Totals	645kcal	68g	47g	20.5 g
Day 4 - Mid-morning snack						
Apples eating raw flesh and skin	174	1x Medium	92	20	1	0.87
		Meal Totals	92kcal	20g	1g	0.87 g
		Plan Total:	1796kcal	208g	91g	67g

Macronutrient Analysis – VEG -Day 4

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	207.9g	121.6g	90.9g	66.9g	16.6g
g/kg body weight	3	1.7	1.3	1	0.2
Kilocal	831	486	363	602	150
Kilocal%	46.3%	27.1%	20.2%	33.5%	8.3%

VEG - Day 5						
Food Name	Quantity	Measure	Energy (Kcal)	Carbohydrate	Protein	Fat
Day 5 - Breakfast						
Oranges flesh only	162	1x small/medium fruit	60	13	1.3	0.32
Hazelnuts kernel only	20	2x 10 hazelnuts	130	1.1	2.8	12.7
Milk skimmed pasteurised average	250	1x cup / serving	88	11.5	8.8	0.75
Dates dried flesh and skin	34	1x Average Portion	98	23.1	1.1	0.07
Oat flakes rolled	40	1x Serving 1/2 cup	149	25.7	4.4	3.2
		Meal Totals	525kcal	74g	18.3g	17.1 g
Day 5 - Lunch						
Yogurt Greek plain low fat	45	1x tablespoon	25.3	1.5	4.6	0.09
Chocolate dark 70-84% Cocoa	25		136	8	2.3	10.5
Cherries flesh and skin raw weighed with stones	154	2x Average Portion	64	14.6	1.1	0.15
Salad mixed	100	1x Small portion	19.1	2.7	1.4	0.3
Watercress raw	80	1x NHS Serving (1 cereal bowl)	18.1	0.32	2.4	0.8
Mixed curry spices	1.9	1x teaspoon	5.2	0.48	0.25	0.25
Flaxseed oil	12.6	1x tablespoon	111	0	0	12.4
Biona Organic Lentils Green in Water 400g	200	0.5x Per pack	180	29.2	13.4	1
Tortilla wraps seeded	40	1x small	109	18	3.8	2.4

		Meal Totals	668kcal	75g	29.2g	27.9g
Day 5 - Dinner						
Oil olive	8.4	2x teaspoon	76	0	trace >	8.4
Lemon juice fresh	15	1x tablespoon	1.1	0.24	0.05	0
Spring greens boiled in unsalted water	150	1x cup shredded/chopped	30.5	2.4	2.9	1.1
Cheese Parmesan fresh	15	1x tablespoon	62	0.14	5.4	4.5
Quorn mince	225	3x serving	192	11.3	29.3	3.4
Pasta wholewheat spaghetti dried boiled in unsalted water	120	1x Medium Portion	157	30	6.2	1.3
		Meal Totals	519kcal	44g	44g	18.6g
Day 5 - Mid-morning snack						
Bananas raw flesh only weighed with skin	158	1x Medium (7")	85	19.9	1.3	0
		Meal Totals	85kcal	19.9g	1.3g	0g
		Plan Total:	1796kcal	213g	93g	64g

Macronutrient Analysis – VEG -Day 5

	Carbohydrate	Sugars	Protein	Fat	Saturated fat
Intake	213.3g	97.7g	92.6g	63.6g	15.1g
g/kg body weight	3	1.4	1.3	0.9	0.2
Kilocal	854	391	370	572	136
Kilocal%	47.5%	21.7%	20.6%	31.9%	7.6%

Macronutrient Analysis – VEG Eat Well Guide Plan (for Claudia’s 5 days plan)

	Kcal/ day	CHO	Protein	Fat	Saturated Fat	CHO – DRV	Protein – DRV	Fat – DRV	Saturated Fat- DRV
Day 1	1794	876	380 (95.1g)	538	143 (15.9g)	48.8%	21.2%	30%	8%
Day 2	1794	857	374 (93.4g)	564	72 (8g)	47.8%	20.8%	31.4%	4%
Day 3	1799	859	358 (89.6g)	582	137 (15.3g)	47.7%	19.9%	32.3%	7.6%
Day 4	1796	831	363 (90.9g)	602	150 (16.6g)	46.3%	20.2%	33.5%	8.3%
Day 5	1796	854	370 (92.6g)	572	136 (15.1)	47.5%	20.6%	31.9%	7.6%
(Average of the 5 day meals)	1796	856	369 (92.26g)	572	128 (14.1g)	47.62%	20.54%	31.82%	7.1%