CAMEL : A UNIQUE SPECIES IN HOT ARID DESERT ECOSYSTEM

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Camel can tolerate high temperature, solar radiation and water deprivation and subsists on poor quality, thorny, vegetation. Camel hair is having great economic importance for its better utility as pure camel hair blends with other fibers in rural cottage industry. Camel milk has comparatively better keeping quality and medicinal properties. Camel hide and bone can also be used for making various types of consumer goods including fancy decorative items. Camel dung is a good organic manure and fuel. Draught use of camel carting is profitable and advantageous over bullock carting for small farmers. Camel is also gainfully utilised riding, racing, ploughing for livestock. Camel's meat, marketing camel as draft and game animal are of economic importance.

INTRODUCTION

As crop yields are low in hot arid desert because of recurrent drought, the farmers of this region rely heavily on livestock enterprises for their sustenance. The livestock should be compatible with crop cultivation instead of competing with it for land and water resources. Camel rearing enterprise fits well such requirements. The abbreviation of CAMEL may be expanded as 'C'-Carrier, 'A'-Arid zone, 'M'-Multipurpose, 'E'-Ecofriendly, and 'L'—Livestock. The camel is a useful component of desert ecosystem where the flora of usually marginal land can hardly meet the requirement of human food and energy. It possesses many unique qualities, which make it distinctly superior to other livestock. This "Ship of the desert" uses various adaptive mechanisms on hot arid sand dune. For instance,

cattle in the central desert of Australia with daily temperature of 40°C, is reported to have died without water in four days while camels survive for more than 15 days in the same environment. It has been estimated that a well-fed camel could carry some six months energy on it's back while cattle are unlikely to carry on more than two-three months, if run out of food. Camels are able to sustain up to 20 to 22% loss of body weight during severe famine conditions, whereas other livestock like cattle and buffalo cannot sustain beyond 10 to 12% loss in body weight¹. Camel population of the world is 19.32 million and that of India is 1.03 million². Indian camel population is mainly confined to north-western states viz : Rajasthan, Gujarat, Haryana and Punjab (93.12% of the total) with highest density (70.13%) of camel in eleven arid districts of Rajasthan³.

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The scientific utilization of bio-energy camel is given on the next page :

Draught use :

The comparative study between camel and bullock carting systems⁴ reveals that pay back period is almost double in case of bullock carting as compared to camel carting, whereas Benefit Cost Ratio is $\frac{3}{4}$ th time higher in case of camel carting. Due to short pay back period and higher benefit cost ratio, camel carting is profitable and advantageous over bullock carting for small farmers. Indian camel can carry a load of 1.5 to 2 tons for 4-6 hours covering a distance of 30-40 km on two and four wheel cart without showing signs of distress⁵. It can work for 4 hrs at a stretch and 6 hrs with 2 hrs rest in between.

Ploughing use :

Camel can produce upto 1.16 hp energy during ploughing covering one hectare in 11 hours and can plough 500 sq. meter/hour at a depth of 16 inch. It can plough continuously for 3-4 hrs covering an area of 3000-3200 Sq meter⁶.

Riding use :

The slender riding camel can cover up to 100 km/day at an average speed of 15-20 km/hr over long period and stocky pack dromedary camel can cover 20-25 km/day at an average speed of about 5 km/hr and can carry burden of 200 kg on its back. The camel can travel 950 km in 29 days and can cover distance ranging from 24 to 70 km/day at an average of 43 km/day in a camel safari across the desert of Rajasthan⁷.

Racing use :

Camel racing in the Gulf and certain Arabian countries is an important cultural event which emphasizes the Bedouin traditions. The long limb length enabled the pacing gait to maintain even at

high speeds. This gait would, therefore, appear to allow greater mechanical efficiency and therefore, speed around 9-10 m/sec to be maintained despite relatively low oxygen availability. There is a better race potential in Jaisalmeri than Bikaneri breed of camels and the female is having better endurance than male⁸.

Defence use :

The camel corps contributes an important wing of Border Security Force of the Indian Para Military services and used for patrolling purpose in the desert belt of international border.

The various aspects of scientific utilization of camel products and byproducts are given below :

Camel Hair :

The camel hair products are an important source of additional income. The handicraft articles made up of camel hair, provide work to rural women in the field of grading of hair, tops preparation, spinning of hair, weaving, embroidery with 100% speciality and blending with sheep wool, goat hair, cotton and other products. Camel hair is widely used in rural cottage industry of Rajasthan and Gujarat for preparation of common utility items viz : blankets, bags, mattresses, ropes, floor rugs, etc. The researches on camel hair blends with wool, silk waste and polyester have shown encouraging results. Blended products are prepared with sheep wool, goat hair and cotton. It is worthwhile to blend camel hair with polyester, wool or silk waste. It has been estimated that a camel hair fabric of 620 gm weight will be as warm as a pure wool fabric of 900 gm weight. The hair of dromedary camels are durable, strong and have low conductivity. The camels of Bikaneri breed of 2-3 years of age produce higher annual

hair yield as compared to other age groups and breeds¹⁰. Annual hair production of camel is depicted in Fig 1. The fineness of hair of Indian camels ranges from 25 to 40 micron. The proportion of medulated fibres ranges from 50 to 80%. The fibre length ranges from 5 to 7 cm. The vegetable matter contents are from 4 to 5%. The pH is 7.02. The single fibre tenacity is better than wool which ranges from 15 to 17 gm/tex. The camel hair and wool blend, polyester blend and silk waste blend have good commercial prospects. The blend slivers exhibit strength of 11 to 19 gm/text.

Camel Milk :

Camels can produce sufficient quantities of milk without any supplementation, both under extensive and semi-intensive management conditions. The composition of camel milk is comparable to that from other domesticated animals. The keeping quality of camel milk is very good and the milk is a rich source of vitamin C. The calculated average lactation length is 305 days. The average daily yield varies from 3.5 to 4.5 liters. The camel milk contains per kilo about 2930.8 KJ of energy and about 35 gm of proteins¹⁰. The total daily energy requirement of a man can be met by 4 kg camel milk and his entire protein requirement by 1.75 kg camel milk. It has, therefore, considerable potential to combat malnutrition of people in arid desert land. The camel milk contains fat 2.9% to 3.5%, SNF 8.2% to 14.3%, lactose 3.4% to 5.8%, protein 3.5% to 4.6%, ash 0.7% to 0.9% and water 81.4% to 87.0%.

Camel Meat :

It is not a common practice to eat camel meat in India, although it is used in substantial quantities in several other countries. Dressing percentage of camel carcass ranges from 40 to 60%. Camel meat

contains about 22% protein and only 1% fat. It has been estimated that an average carcass weighing 210 kg would yield 10 kg fat, 160 kg meat and 40 kg bones and would thus yield 35 kg protein and 9973125 KJ energy which will be sufficient to meet the protein requirement of about 35 people¹⁰. The optimum age for camel slaughter is around 3-4 years.

Camel Hide :

Recently camel hide is used for making various type of leather goods and fancy items of public interest viz : shoes, sandals, purse, bag, stool cover, rope, jewelry box, toys and various decorative items, etc. In earlier era, camel hides were utilized to make containers for storing and carrying water, oil and ghee, etc. This hide is well suited for application of colour and in Rajasthan there is a tradition of making elaborately painted small container (*kuppi*) by using camel hide. It has good export potential.

Camel Bone :

Camel bones are important raw material for the manufacture of jewelry in some parts of the world. In India, since ivory has been banned, it has often been replaced by camel bones. Of late, camel long bones are used for making fancy and decorative items. It has same potentiality as ivory but less costly. Camel bone is also used as bone-meal and fertilizer.

Camel Dung :

Dung ranks as an important byproduct. Camel dung is good source of organic manure and dry dung is also used as fuel. For pastoralists inhabiting in barren territories, it can be the most important source of fuel. This dung can be sold by camel herd owner for good price. Camel breeders used to compensate the landowners by cash or by providing

camel dung for overnight stay on their fields. Brick factories are also using camel dung as fuel.

Camel as Game Animal :

In recent times, the use of camel as a game (polo) animal in the Gulf countries and certain Arabian countries gained enormous importance. Very big amount of money is involved and the economic importance of camel as game animal has increased tremendously. Camel safari is very much popular among tourists. In India, camel dance, use of camel in marriage and other social programmes have a great socio-cultural importance.

Camel Marketing :

Animal husbandry nevertheless plays a vital role in the economy of India and contributes more than 60% of the GDP of the region. Camel marketing through livestock fairs in western Rajasthan has opened new avenues for farmers. Marketing of camel is considered an important trade in Rajasthan where it is widely used as draft animal. Camels are mostly marketed at big animal fair such as at Nagour, Pushkar, Tilwara, Phalodi and Gogameri in Rajasthan.

CONCLUSION

Camel is a unique and important component of the desert ecosystem because of its adaptation in behavioural, anatomical, and physiological functions. It is very essential to adopt scientific management practices to get efficient utilization of camel resources round the year for different purposes.

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