

CAMEL MEAT AS A PANACEA TO ANIMAL PROTEIN SHORTAGE

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ABSTRACT

This study was carried out to evaluate the potential of camel meat and how significant it can be as a panacea to reduce animal protein shortage in Nigeria. Slaughtered data of selected species of animals mostly consumed in the Northern Parts of Nigeria especially Borno State (the study area) for a period of ten (10) years (1982-1991) was collected and analyzed. The abattoir records from the State Ministry of Agriculture and Natural resources (MANR) for the whole state indicated 373,417 cattle; 608,199 goats; 221,047 sheep and 84,954 camels. The records indicate that cattle produced 63,682.20 metric tonnes of meat while that of goats, sheep and camels were 9,213.10, 5,526.20 and 24,126.98 metric tonnes of meat respectively. The mean metric tonnes of meat by animals were 579.436 ± 15.399 ; 75.945 ± 2.287 ; 46.769 ± 2.376 and 199.498 ± 15.240 for cattle, goats, sheep and camels respectively. From the result, it can be established that the carcass yield of camel is very high compared with other species. An average 522kg live weight camel gives about 280kg meat and an average 375kg bull 170kg, and an average 33kg goat 20kg and an average 53 kg sheep yields 30kg meat. From the carcass yield, dressing percentage and other factors enumerated that are very beneficial and advantageous in favour of camel production above other species are pointers to encourage increase production of camel meat as a viable potential option to bridge the gap created by animal protein shortage in the extreme northern parts of Nigeria in particular and the whole nation in general.

Keywords: Camel, meat, carcass yield.

INTRODUCTION

Animal protein consumption in Nigeria and other developing countries has been reported to be comparatively low (Ayorinde and Aromolaran, 1998). Consequently, increasing demand for milk and meat as a result of increasing human population and rapidly changing climatic and ecological factors has therefore necessitated the need for development of camel production (FAO 2001). The strength of a nation depends on the wealth of food it can provide for its people, but it is unfortunate to note that in most developing nations, provision and availability of these foods in their right proportion for the citizens has not been adequate. This problem has generally been attributed to shortage of animal protein products which is responsible for the existing high price of animal products making them out of reach to an average Nigerian (Akinmutimi *et al.*, 2006; Etuk *et al.*, 2011).

Making available adequate animal protein for human consumption will continue to necessitate research on how to increase productivity. One of the ways of ameliorating this problem is to focus our attention on solving this problem by directing efforts at promoting and encouraging production of other indigenous animal species that will cost less to produce and can reduce the animal protein shortage in Nigeria.

Camels are important livestock species in the subsistence economy of rural pastoral communities (Aujla *et al.*, 2013). Particularly in arid and semi-arid lands (Field, 2005). Camel is an ancient animal well known in the history of human civilization. It belongs to the class mammalia; the order Artiodactylan; sub-order Tylopoda; and family camelidae (Alhaj and Al Kanhal, 2010). There are two known species of camels namely; *Camelus bactrianus* (the two humped) and *Camelus dromedarius* (the one humped) which is also called the trade camel or Arabian camel (Dorman, 1986).

Population of dromedary camels in the world is estimated to be 20 million (FAO, 2008). In Nigeria, most camels are concentrated around arid zone area and their population is put at 87,000. In the extreme northern part of Nigeria, especially north east and north-west geo-political zone, they are mostly raised by pastoralists. They contribute to household food security through meat and milk (Ahmad *et al.*, 2010). They are used as pack animals for transport and provide household income through sales of live animals, meat, milk, fat and other by products like hides (Mochabo *et al.*, 2005; Faye *et al.*, 2010; Aujla *et al.*, 2013).

The fodder that is available in the arid zone consists mainly of grasses and the leaves and twigs of shrub and trees. Adaptation of the plants includes a thickening of the plants covering, reduction of leaf size, and curling of leaves. The grazing habits of camels, unlike those of cattle, sheep and goats are comparatively with this plant “behavioural” adaptation to the acidity. Morphologically, they are small in order to minimize water losses. Behaviorally, they have extremely short life cycle. These plants have a high salt content, mostly bitter and often thorny and other grazing animals avoid them as much as possible. Camels also browse trees and shrubs belonging to *Salvadora*, *Zizyphus*, *Dobera*, *Cadeba* and *Boscia*. The leaves of the trees that camels browse contain much water while the grasses and herbs are normally quite desiccated. Practices include free grazing and utilization of crop residues in dry season.

Camel meat is of good quality especially in areas where other meat animals find it difficult to thrive (Kadim *et al.*, 2008). The camel meat is accepted in the northern parts of the country (the study area) and recently, it is systematically being introduced into the southern parts. The palatability of camel meat is controversial as some authors are prejudged against camel meat and described it as coarse-fibred, tough, watery and having sweetish taste. Camels and oxen differ with regard to feeding habits. Abbas *et al.* (1995) reported that dromedaries spent 81% of their feeding time on herbs and acacia bushes, and only 19% on grasses, with *Bracharia* and *Arisida* species being the most preferred species. Wilson (1989) observed that dromedaries take as much as 90% of their diet from browse plants. The camel can also be fed with green fodder or concentrates and can

utilize a wide range of agricultural by-products. According to Rutagwenda *et al.* (1989), in 90% of their total feeding time during dry season, camel consumed 22-27 plants species, compared to only 8 taken by cattle.

Camels possess a unique ability to convert the scanty desert plant resources into a milk, meat and fibre (Ahmad *et al.*, 2010). They have got almost no competition for feed with other animals, are hardy and comparatively eat less (Khan *et al.*, 2003) hence able to be easily integrated into other production systems. The digestive tract of the camel function more efficiently than that of cattle, sheep and goats. Food pass rapidly through the camel’s stomach and enters intestine. Camels do not migrate in dry season as compared to other livestock.

It has been reported that camels can be infected with a range of helminthic parasites without obvious changes in blood parameters (Bamaiyi and Kalu, 2011). While camel rearing is still at its subsistence, it presents a viable opportunity for household resilience enhancement in the area especially as cattle that have traditionally been relied upon start experiencing production challenges due to the recurrent and prolonged drought.

The primary objective of this paper focuses on the meat aspect and to some extent the milk which is both high sources of animal protein. In this study, Borno state was used as a pilot state.

MATERIALS AND METHODS

LOCATION OF THE STUDY AREA

The study was conducted in Maiduguri metropolis. Maiduguri is the capital of Borno State, one of the thirty-six (36) states in Nigeria with the population of about 200.96 million people (NPC, 2019). The state has the largest area of 116,559 square kilometers among other states in Nigeria, which constitutes about 8 – 12% of the total area of the country (Borno State Official Diary, 1995). The state shares border with states of Yobe, Adamawa, Gombe and Jigawa. It also shares international boundaries with Republic of Chad, Niger and Cameroon (BSOD, 1995). It is situated on latitude 11.5° North, longitude 30.05° East and an altitude of 354m above the sea level (BSOD, 1995).

Maiduguri is a semi-arid region which lies within Sahel region of West Africa and is noted for great climatic and seasonal variations.

The area usually has a very short period (3-4 months) of rainfall and a very long dry season (December – February) which could be relatively dry, but extremely hot. Rainy season starts from late May to September to early October. Ambient temperature is about 31°C by August, but can go up to 40°C or more by April – May, while relative humidity is 45% in August, it could be as low as 5% by December to January. Borno state is the largest producer of livestock in Nigeria. It is estimated that the state contributed about 40% to the livestock production in Nigeria (Alaku and Moruppa, 1983). The major livestock producers are the nomadic “FULANIS” and “KWAYAM” who spread all over the state. Also in this business is the semi-nomadic Shuwa Arab who inhabits the northern corner of the state.

ESTIMATION OF CARCASS YIELD

The average carcass yield of each animal was estimated from the body weight of frequently slaughtered animals at the abattoir and with the guide from the estimate made by Sade and Alaku, 1991 as follows:

- (i) Cattle: Carcass yield is estimated to be 185kg per cattle or 49.33% dressing weight with average live weight of 375kg.
- (ii) Sheep: Carcass yield is estimated to be 25kg per sheep or 47.17% dressing weight with average live weight of 53kg.
- (iii) Goat: Carcass yield is estimated to be 15kg per goat or 45.46% dressing weight with average live weight of 33kg.

(iv) Camel: Carcass yield is estimated to be 284kg per camel or 53.38% dressing weight with average live weight of 532kg.

It must be noted that there are variations in the weight of animals during different seasons and also variations in individual weight. The average weight covers those and above the estimated weight.

DATA COLLECTION AND STATISTICAL ANALYSIS

The data used for this study were the slaughtered animal records from Borno State abattoirs as recorded by the State Ministry of Agriculture and National Resources for a period of ten (10) years (1982-1991). The data were subjected to analysis of variance (ANOVA) using the SPSS software (2012) to find the variation in meat yield among the four species.

RESULTS AND DISCUSSION

Table 1 shows the slaughtered records of four (4) major livestock species widely consumed in the Northern part of Nigeria obtained for the period of ten (10) years (1982 – 1991). A total of 373, 417 cattle, 608,199 goats, 221,047 sheep and 84,954 camels were slaughtered in the period under review.

The table showed that there is higher prospect of shifting attention to camel meat in order to meet the animal protein deficit in Nigeria.

Table 1: Total number of slaughtered animals yield in metric tons / kilogram and % contribution

Animal Species	Total No.	Metric Tonnes	Carcass Yield / Animal		Percentage (%)	Contribution
			Tonnes	Kilogram		
Cattle	373,417	63,682.20	0.17	170	62.21	
Goats	608,199	9,213.10	0.02	20	8.97	
Sheep	221,047	5,526.20	0.3	30	5.38	
Camels	84,954	24,126.98	0.28	280	23.52	

Source: Ministry of Agriculture and Natural Resources, Borno State (Abattoir Records) 1992.

A total of 373,417 cattle produced 63,682.20 metric tons of meat representing 62.21% and about 170kg of carcass yield per animal, while 608, 199 goats yielded 9,213.10 metric tons of meat representing 8.97% and about 20kg per animal while 221,047 sheep

yielded 5,526.20 metric tons representing 5.38% and about 30kg per animal, while 84,954 camels yielded 24,126.98 metric tons representing 23.52% and about 280kg per animal. From the result, camel with its large body mass has advantage over other species.

Table 2: Classification of domestic livestock on the basis of feeding behavior, feed and water intake

Livestock Type	Preferred forage plant	Number of forage plants consumed *%	Height of browse above ground level, m	Watering interval days
Camel	Trees & shrubs	170	3.5	10-14
Goats	Shrubs & herbs	184	1.6	3-4
Sheep	Herbs & grasses	142	1.2	3-4
Cattle	Grasses	100	1.5	2

Source: Schwartz (1989) * Number of plants used by cattle is 100%

Table 3: Proportional composition of carcasses of some animal species including camel

Animal Species	Live weight kg	Protein %	Fat %	Ash %
Goat ^a	32.20	62.33	25.96	3.81
Cattle ^b	295.50	65.00	17.90	15.10
Sheep ^c	38.40	31.20	59.50	9.00
Camel ^d	350.00	52.76	0-7.80	9-38.10

Source: Haas and Horst, 1979.

CONCLUSION AND RECOMMENDATIONS

The outcome of this study revealed that camel meat is highly desirable. It has acceptable amount of protein, very high amount of minerals (Ash) and low amount of fat adequate for the body. Hence, the following recommendations are made:

- Research institutes in collaboration with the already established Livestock Investigation and Breeding Centre should embark on intensive research programmes on camel production and breeding for increased production and consumption of quality protein.
- The use of modern technologies to improve camel production for supplying more meat, especially for growing urbanized market.
- Government should give adequate financial support to the research institutes and Livestock Investigation Breeding Centres for increased camel production and quality animal protein.

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