THE SIGNIFICANCE OF CAMEL PRODUCTION IN NIGERIA

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ABSTRACT

Aspect of camel distribution, adaptations and utilisation in Nigeria have been reviewed and a suggestion made for a scientific and profitable camel production to ease the deficit of animal protein in the Nigerian diet.

This is necessitated because the encroachment of the desert into the Northern part of the country strongly calls for the reassessment of the potential contribution of camel production as source of meat and milk to provide not only essential protein source in the Nigerian diet, but also saving on the scarce foreign exchange.

INTRODUCTION

Over the years, Nigerians have been finding it increasingly difficult to meet the demand for animal protein foods. This has resulted in the increasing importation of meat and milk products in recent years. While the per capita protein requirement is estimated as 85.9g of which 34.0g should be of animal origin (Abdulkadir 1985), the average Nigerian consumes between 6.5 – 8.6g

animal protein per day compared with U.S.A., 64g; Denmark, 57g; United Kingdom, 54g; and the Federal Republic of Germany, 49g. It is obvious that the average animal protein consumption by Nigerians is grossly inadequate.

Nigeria depends largely on cattle, sheep and goats, poultry, pigs, fish and other areas game animals for her animal protein foods. Of these, beef is the widely used animal protein. Consequently, the production, therefore, is the backbone of the livestock industry in

most parts of Nigeria. Consequently, most of the effort is directed towards improvement of cattle production and management.

Efforts to improve beef cattle production have resulted in poor performance response of animals in the tropics, due principally to poor rate of growth to mature live weight, low reproductive rate, long calving and prevalent livestock diseases. These, coupled with poor and inadequate feeds available to the animals and the slow rate of acceptance and utilisation of modern techniques by livestock farmers, have hampered livestock development in the country.

Though the far northern parts of the country bordering Niger and Chad Republic are free of trypanosomiasis (the disease that poses a great threat to the livestock industry), these areas suffer frequent drought and are threatened by desert encroachment. While the southern areas that have enough vegetation to support cattle production all the year round are endemic to trypanosomiasis. Thus it can be said that the environment is harsh to cattle production in some parts of the country. The Fulanis who own most of the cattle are therefore forced to migrate from the north to the south in the dry season and back to the north in rainy season in search of food and to avoid the hazards of trypanosomiasis. While solutions to these problems are being sought, it is pertinent to look for other potential sources of animal protein. The objective of this paper is to highlight the distribution, adaptation and meat and milk

potential of the camel with a view to advocating camel production an appropriate place in livestock production in Nigeria.

DISTRIBUTION, ADAPTATION, PRODUCTION AND UTILISATION

Of the 14.1 million camels in the world (Knoess, 1977), 9.6 million are found in Africa while the remaining 4.5 million are found in Asia. The African camels are the dromedary species. Most of the camels in Africa are found in the semidesert parts of the continent like Ethiopia — 0.01 million, Somalia — 3.089 million, Sudan — 2.6 million and Mauritania — 0.722 million (Knoess, 1977). Thus camels are distributed over the semiarid and arid tropical and subtropical regions of Africa and Asia (Burgemeister, 1978).

The camel is well adapted to the desert and semi-desert environment which is considered to be otherwise harsh to human and animal habitation. The ability to withstand the extremely dry and hot climate is the most striking aspect of camel biology. This is achieved by virtue of its body insulation and diurnal heat storage; extremely economical use of water, small volumes of urine, low rates of faecal water loss and efficient sweating; ability to maintain blood stream and interstitial fluid volume during water deprivation and the capacity of rapid and complete rehydration (Kuthe, 1976; Mcknight, 1969).

Camels are reputed for the catholicity of their tastes for food. Sustenance can be obtained by the camel from almost anything that grows (Mcknight, 1969). They feed diurnally or nocturnally and are unrivalled in their ability to utilise the desert and semidesert vegetation which have evolved certain characteristics like thorns, odours and secretions that have made them unacceptable to many animals. They are capable of using poor quality grazing and,

because they have long legs and neck, are capable of browsing on trees and shrubs which are beyond the reach of other animals. Camels have been fed on green fodder and concentrate feeds such as millet, oats, beans, cotton-seed, molasses maizebran and grain, and it is found that they can utilise a wide range of agricultural by-products (Knoess, 1977).

Knoess (1977) reported feeding trials on *Panicum maximum* at a time when the grass was beyond the flowering stage and rather dry. The camels were able to maintain themselves on this fodder and were able to produce a sizeable amount of milk. By contrast, Adal sheep were unable to make any weight gains during one month of grazing on the same pasture. In lowlands of Ethiopia, grazing trials on alfalfa irrigated pasture were carried out and the camels were found to perform very well.

In Iran, the dromedary camels were fed in feedlots (Kazem-Khatami, 1970). The ration consisted of 15–20kg of low cost feed comprising straw, beet pulp silage, molasses and barley (barley not exceeding 10–15% of the ration). At a sugar beet farm, camels were grazed experimentally on sugar beet tops during harvest time and average weight gains were 0.9kg per day for female and 1.4kg for males (Kazem-Khatami, 1970).

The indigenous camel population in Nigeria is estimated at about 16,000 heads (F.A.O., 1966). These are mostly found in the Sahel Zones (figure 1). This zone is characterised by 300–600mm precipitation from June to September. The amount and distribution pattern of rainfall is often unpredictable. Maximum day temperature of 45°C occurs in April while Relative Humidity is 10% in February and almost 100% in August (Bargemeister, 1978). The slaughter figures of trade camel is over 11,000 per annum (table 1) with most of the camels slaughtered being trade camel from Niger and Chad

Fig. 1: Map of Nigeria showing:

- (i) The vegetation Belts. Note the encroachment of the Sahel Savannah Belt into the Sudan Savannah Belt during the draught seasons.
- (ii) The major camel meat slaughtering (consuming) towns.
- (iii) The major trade camel entry routes (arrows) into Nigeria.

TABLE 1.

Slaughter Figures of Camels in Major Towns of the far North for 5 years.

	Kano	Kaduna	Maiduguri	Sokoto	Total
Year	Number of Camels				
1976	8,123	1,396	692	3,222	13,523
1977	7,940	1,243	487	2,254	11,924
1978	11,321	976	291	5,624	18,212
1979	7,517	1,186	143	2,491	11,337
1980	11,381	1,812	251	4,092	17,536
Total	46,372	6,613	1,864	17,683	72,532

Source: Quarterly Livestock Market Survey of Federal Livestock Department.

Republics (figure 1).

In Nigeria, camels were used in the areas of the far north for transportation of goods across the Sahara during the days of the trans-saharan trade. Busi-

ness cities like Kano and Maiduguri were reputed for their camel loads of goods. Nowadays, camels have lost their value as means of transportation because trade across the Sahara is minimal and

the advent of motor vehicles which are faster and more comfortable, have put a stop to large-scale transportation by the camel.

Literature on camel husbandry and use in Nigeria is scanty. Most of the camels (1-5 per herd) are raised on a free range basis with the camels allowed to roam about freely in search of their food. They are however herded in the rainy season. Camel feed being 46% leaves and stem of acacia, 25% herbage and vines, 29% grasses, supplementary feed of grain, legume straw, hay, wheat-bran and salt is given when no grazing is available.

It is observed (Burgemeister, 1978), that the camel gains weight rapidly in the first four years after which increase in weight becomes minimal. Slaughter of the camel between 4-5 years is usually recommended (Burgemeister, 1978).

The killing-out percentage of 400kg camel is between 55-65% and the carcass consists of 52.8% to 76.6% meat, 4.8% fat and 15.9% to 38.1% bones (Kuznetsov and Tretyakov, 1970). The palatability of camel meat is controversial as some authors are prejudiced against camel meat and described it as coarse-fibred, tough, watery and having sweetish taste (Burgemeister, 1978). Other workers attribute these to the fact that only older animals come to slaughter. Studies in Egypt reported that the creatinine content is between 1.5 and 2.5 times higher in meat of camel than in beef which means that camel meat should be more tasty. An objective test of taste showed that the camel meat is of an excellent quality (Knoess, 1977). Meat from young camel in good condition has also been described as equal to the best beef (McKnight, 1969). The average slaughter weight of camel in Nigeria is between 300-400kg and costs between ₦300 and ₦600 liveweight per head as compared to cattle of the same size that costs between ₦600 - ₦1,000.

The camel meat is accepted in the northern parts of Nigeria and recently it is systematically being introduced into the southern parts of Nigeria. Slaughter figures for some of the Northern towns are shown in table 1. Slaughter of camel has been reported in other towns such as Yola, Jos, Zaria, Makurdi, Minna and Lagos (FLD Quarterly Livestock Survey). Approximate slaughter weights of between 400-450kg give 120kg meat, 16kg skin, 26kg trimmings and 70kg bone (Kuznetsov and Tretyakov, 1970). With the present economic slump in Nigeria and the resurgence of diseases in epidemic proportions, Nigerians cannot afford to overlook the potential of the camel as an animal protein source. Table 2 shows the proportionate composition of the carcasses of some domestic animals (including the camel) that are used for food in Nigeria. Although the meat to bone ratio is low when compared with other domestic animals, this should not be seen as a disadvantage as the bones are readily converted to other uses.

Basically, milk is nature's best food for infants because of its content and proportions of minerals, vitamins and essential amino acids. Camel milk has an added advantage of being very rich in Vitamin C (table 3) and is considered to have therapeutic properties (Burgemeister, 1978). The lactation period of the camel varies from 12 to 14 months but milk yield depends on the state of nutrition of the camel. Burgemeister (1978) reported an average daily milk yield of 5.0kg per day while Knoess (1977) reported an average daily yield of 6.6kg per day. A range of 8.0kg to 13.0kg per day has also been reported (Knoess, 1977). Table 3 shows that the camel milk is comparable to that of cow, goat and sheep in quality, but has a relatively higher vitamin C value than the other animal species.

In addition to its use for meat and milk, camels have been used for traction

TABLE 2.

Proportional Composition of Carcasses of some animal species including camel.

<i>Animal Species</i>	<i>Live Wt. Kg</i>	<i>Protein (%)</i>	<i>Fat (%)</i>	<i>Ash (%)</i>
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: a, Haas and Horst, (1979).**b, Preston and Willis, (1976).**c, Owen (1976).**d, Burgemeister (1978).*

TABLE 3.

Average Composition of Milk from Cattle, Sheep, Goats and Camels.

<i>Constituents</i>	<i>Barka Cows</i>	<i>Adal Goats</i>	<i>Adal Sheep</i>	<i>Adal Camels</i>
.....percentage				
Moisture	86.1	88.2	86.4	85.6
Ash	0.6	0.6	0.6	0.9
Protein	3.8	3.3	4.4	4.5
Ether Extract	5.0	2.9	4.1	5.5
Carbohydrate	4.5	2.8	3.7	3.4
.....mg/100g				
Calcium	128	133	144	140
Phosphorus	108	97	122	138
Iron	0.52	0.38	0.41	0.5
Thiamin	0.04	0.04	0.04	0.06
Riboflavin	0.01	0.03	0.04	0.08
Niacin	—	—	—	—
Vitamin C	1.45	1.97	1.34	2.30

Source: Knoess (1977)

in the Sudan. The potential for similar use in Nigeria is yet to be reported.

DISCUSSION

As Nigerians generally consume food not well balanced as regards animal protein content of the food, use of camel meat can contribute to improve the deficiency in protein in the diet. The slaughter figures in table 1 indicate the extent to which the imported trade camel has been contributing towards improving the animal protein content of the Nigerian diet. Though the figures are encouraging, it should be borne in mind that most of the camels slaughtered are not of *indigenous* source but are imported into this country from the neighbouring countries; Niger Republic and Chad Republic (figure 1). Statistics for the *indigenous* camels slaughtered are not available and like the other livestock in Nigeria the reported total number of *indigenous* camels may not be reliable.

With insurgence of the draught to the far northern parts of this country, rendering it semiarid and therefore not able to support other forms of livestock production, such areas could be utilised for camel production. Its thick-skinned lips help it to browse the desert trees which have developed thorns. Thus these two qualities of the camel — the ability to survive extremely dry and hot areas and its ability to feed on any fodder, place it above other animals in this zone. So in the far north, the areas can be efficiently utilised during the rainy season as well as the dry season for camel production.

The potential of raising the camel in the Sahel Savannah parts of Nigeria is great. Already there are a number of families that derive their livelihood by raising camels. These farmers should be given all possible encouragement to raise the camels just as the cattle owners are being encouraged. The presence of three

major River Basin Authorities in the semiarid zone, viz., the Rima Basin Development Authority, the Hadeja Jama'are River Basin Development Authority and the Chad Basin Development Authority (more basins have recently been established), raises the issue of the livestock potential of these River Basins which is yet to be tapped. These potentials cannot only be tapped for the production of cattle, sheep and goats but also for the production of camels as they are less specific in their feeding, and adapt very well in these areas. Thus camel can readily utilise the wheat straw, the maize cobs and rice straw and rice hulls as well as other agricultural waste products of these basins. The importance of raising camel is further buttressed by the slaughter figures (table 1), by the superior lean meat qualities of camel meat (table 2) and the high nutrient content of its milk in table 3 (Knoess, 1977). Using Knoess' (1977) observations, it could be seen that camel milk has the highest values for ash, fat, vitamin C, riboflavin, thiamin and phosphorus. All of these are very essential in the human diet and in addition, the high protein content of the milk assists in improving the general health conditions of the communities that inhabit the Sahel and Sudan Savannah parts of Nigeria.

In conclusion, it is worthy to note that there are several Livestock Investigation and Breeding Centres (LIBC's) that are within this semiarid zone or area at its fringes; those in Bulasa in Birnin Kebbi, Kabomo, Gidan Kwakwa Katsina and Dalori have for years overlooked the breeding and improvement of the camel. In addition to the Livestock Investigation and Breeding Centres, the National Animal Production Research Institute, Shika, The National Veterinary Research Institute Vom, and even the more recently incorporated Lake Chad Research Institute Maiduguri, have conspicuously kept the camel out of their

programmes all these years. With the present encroachment of the desert, it is pertinent for these research Institutes to start an articulated research programme on camel production and breeding in collaboration with the already established Livestock Investigation and Breeding Centres aforementioned.

REFERENCES

- ABDULKADIR, I.A. (1984). Animal protein supply in Nigeria. Problems and prospects. *NAPRI Bulletin* 8, 20 – 54.
- BURGEMEISTER, R. (1978). Distribution and use of dromedaries. *Animal Research and Development*. 7: 39 – 48.
- FAO (1966). Agricultural Development in Nigeria (1965–1980). Food and Agricultural Organisation of the United Nations. Williams Glows and Sons Ltd., London.
- HAAS, H.J. and P. HORST, (1979). The significance of Goat Production for Covering protein Requirement. *Anim. Res. and Dev.* 9: 41–76.
- KAZEM-KHATAMI, (1970). Camel meat, Tehran, Ministry of Agriculture (cited by BURGEMEISTER, 1978).
- KNOESS, K.H., (1977). *World Animal Review*. 22: 39–44.
- KUTHE, G., (1976). Physiological and Nutritional Requirements of Foraging Livestock in Arid Climate Regions. *Animal Res. and Dev.* 3: 112 – 119.
- KUZNETSOV, V.A. and V.N. TRETYAKOV, (1970). Carcass classification in the Turkmen **single-humped** camel. In: Trudy. Turkmen. Sel-Khoz. Inst. 15: 130–133. (Cited by BURGEMEISTER, (1978).
- McKNIGHT, T.L. (1969). *The Camel in Australia* Melbourne University Press, Australia.
- OWEN, J.B. (1976). *Sheep Production*. Bailliere Tindall London Toronto. New York.
- PRESTON, T.R. and M.B. WILLIS, (1976). *Intensive Beef Production* 2nd Edition Pergamon Press, New York.