SLAUGHTER OF THE DROMEDARY (SINGLE-HUMPED) CAMEL (*Camelus dromedarius*) FOR MEAT IN A SEMI-ARID ENVIRONMENT OF NORTH-EASTERN NIGERIA

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ABSTRACT

Monthly records on camels slaughtered for meat from 1982 to 1989 at the Maiduguri abattoir were collected and analysed to determine the seasonal and annual trends in slaughter and meat supply from the dromedary or single-humped camel (*Camelus dromedarius*). There were highly significant ($P < .01$) seasonal and yearly variations in the number of camels slaughtered. In any given year, greatest numbers were slaughtered by March-May which represents the last stages of the long sahelian dry season. Lowest numbers were slaughtered towards the end of the rainy season. About equal numbers of males and females were slaughtered annually. In 1989 alone, up to 13% of the females slaughtered were pregnant. An average of 9,150 camels were slaughtered yearly giving an estimated carcass yield of about 2,596,397kg of camel meat per annum. Camels slaughtered within the three years of 1984/1986 represented about 61% of the total for the eight years. The period from 1983 to 1986 was another drought period in the sudano-sahelian West Africa. Attention should be given to our draught animals hitherto neglected so that their drought, meat, milk and other potentials could be exploited to the full benefit of our national economy.

INTRODUCTION

Until recently, research and development projects in animal production in Nigeria have concentrated on cattle, sheep, goats, pigs and the domestic fowl. Recently, some attention has been given to such other species as the grasscutter (Abana, Chiejina and Ikeme, 1984), wildlife in general (Ajayi, 1974), and other species of poultry such as the Guinea fowl (Akande and Oluyemi, 1984; Ayorinde, Ayeni and Okaeme, 1984; Okeke, Orji and Ezike, 1984), ducks (Okaeme, Ayorinde and Ayeni, 1984) and turkey (Ayeni, 1986). As it is, those species largely classified as draught animals are more or less completely ignored.

Nigera is blessed with sizable numbers of such beasts of burden as the camel, horses, mules and donkeys. These animals are the most versatile, of all the domestic species, in their contribution to the general economy of any Third World country. They are used for transportation, ploughing, milk production and recreation when they are in good health and condition. When they are disabled or too old to serve, they are sold for cash or slaughtered for meat. Much of the meat we eat in various parts of Nigeria is actually derived from camels, horses and donkeys (Federal Livestock Department, FLD, 1984). We in Nigeria cannot, therefore, afford to continue to ignore the huge population of draught animals with which our country is endowed.

This study was conducted to investigate the contribution of the single humped or Dromedary camel (*Camelus dromedarius*) to the meat consumed in a sudano-sahelian environment of north-eastern Nigeria. In fact it has been known that northern Nigeria is one of the areas in Africa where camels are thought to be fairly extensively used for meat (Mukasa-Mugerwa, 1981) and Jos, Kaduna, Kano and Sokoto have been specifically mentioned (FLD, 1984). Though Dada (1978) estimated that up to 3,410 camels were slaughtered between September and December at Kano abattoir, very little or nothing exists on the trend of slaughter of camels in the country. This study was done also to find if there were seasonal and yearly variations in the supply and

slaughter of the dromedary camels for meat in this part of sub-saharan Africa.

MATERIALS AND METHODS

Records of the monthly slaughter of the Dromedary Camel (*Camelus dromedarius*) in the Maiduguri abattoir from 1982 to 1989 were collected and used for this study. For the purpose of this study the year was divided into four seasons viz: Cold-dry (December to February), Hot-dry (March to May), Rainy (June to August) and Post - rainy (September to November) seasons.

All data were subjected to analysis of variance (Steel and Torrie, 1960). Means for the seasons of slaughter and the two sexes were compared to see if there were significant differences among them and Duncan's multiple range test was used (Steel and Torrie, 1960). The yearly slaughter data were also related to annual precipitation within the environment. Foetuses encountered in slaughtered female camels were calculated as percentage of all females slaughtered for the year 1989 for which data were avaliable.

RESULTS AND DISCUSSION

Season of the year showed highly significant ($P < .01$) influence on the number of camels slaughtered for meat in this sudano-sahelian environment (Table 1). In any given year the highest slaughter rate (about 39%) occured during the hottest months (March-May) of the year which represent the last stages of the long dry season. Thereafter, slaughter rate declined rapidly throughout the entire rainy season until September when it attained its lowest level. Slaughter rate rises again with the start of the long dry season to attain its peak by April-May in the following year. In effect the highest number of camels (about 1,257) were slaughtered in the month of April and the lowest (only 261 camels) in September. Slaughter rate was similar for the rainy and cold -dry seasons (25.33 vs 24.27) and lowest after the rains (only about 12%).

Figure 1 shows the monthly trend in both the number of camels slaughtered in 1982 to 1989 and those transported to southern Nigerian markets for slaughter (FLD, 1984). The trend for the southern transportation seemed to be bimodal with the higher peak occuring by January-February and the lower by September-October, just after the rains. The lowest level in transportation occured in the month of August during the rainy season.

Similar trends in slaughter for meat in Maiduguri and in transport to the southern Nigerian markets with appreciably greater numbers being involved in the long dry season have been observed earlier for cattle (Alaku and Igene, 1983; Igene and Alaku, 1984), sheep and goats (Alaku and Igene, 1986). In this sudano-sahelian environment and under the prevailing pastoralist system it does not seem that the

TABLE 1. MEANS SEASONAL SLAUGHTER OF MALE AND FEMALE CAMELS AND BOTH SEXES COMBINED.

Season	Sex				Both Sexes Combined ± S E
	Male	As % Total	Female	As % Total	
Cold-dry	457.28^{b}	54.93^{a}	375.17^{b}	45.06^{b}	416.22 ± 46.21^{b}
Hot-dry	652.11^{a}	51.77^{b}	607.56^{a}	48.23^{a}	629.84 ± 50.08^{a}
Rainy	437.56^{b}	52.15^{b}	401.44^{b}	47.85^{a}	419.50 ± 52.97^{b}
Post-rainy	224.33^{c}	55.90^{a}	177.00^{c}	44.10^{b}	200.67 ± 25.72^{c}

Means not followed by the same superscript within a column are significantly different at $P < .01$

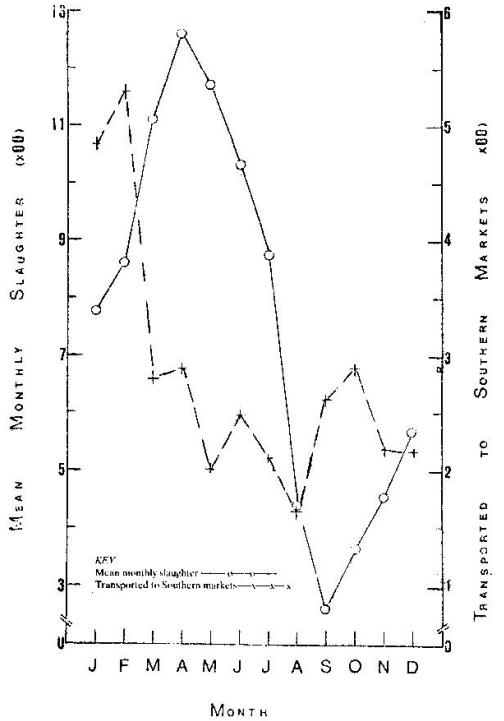

Figure 1. Monthly slaughter of camel in Maiduguri and number transported from the north to southern Nigerian markets for meat.

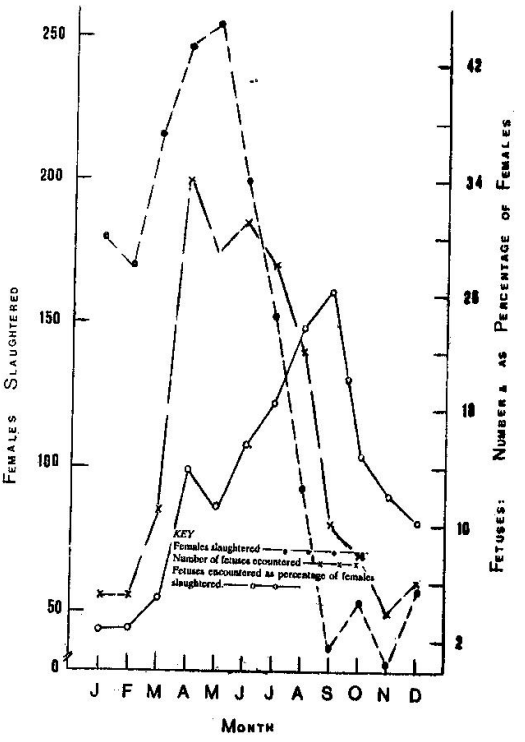

Figure 2. Number of females slaughtered, fetuses encountered and the fetuses expressed as percentage to the females

theory and law of supply and demand do hold with regard to the off take of livestock for slaughter or sales. Sales of livestock by pastoralists are made in larger part essentially to salvage diseased animals or animals at the risk of starvation and dehydration especially during the long dry season. Camels are raised here mainly for transportation and as a source of milk supply (Mukasa-Mugerwa, 1981). Therefore those camels butchered for meat are said to be worn out, the incurably injured and the barren as there are no breeds specifically developed for meat as is the case in Kenya, Somalia, Sudan and Ethiopia where a considerable number is managed and fed specifically for slaughter (Williamson and Payne, 1978). Herdsmen withhold sales when food and water are available in abundant supplies (FLD, 1984) or when animals are healthy and in good conditions.

There was no significant sex influence on the number of camels slaughtered as there was a male to female ratio of 1 : 1 (53.69 vs 46.31% respectively, see Table 1). Similar observation had earlier been made in cattle slaughtered here for meat (Igene and Alaku, 1984).

Data available also show that in 1989 alone about 13% of the females slaughtered were pregnant. Absolute number of foetuses encountered was highest between May and July while, when expressed as percentage of total female slaughtered, it was highest towards the end of the rainy season (Fig. 2). This is not easy to explain. Foetuses were encountered in about 2.8% females camels by January and in as much as 26.3% in the month of August (Fig. 2). In Mali, Wilson (1986) observed that 68% of cattle, 76% of sheep and 54% of goats slaughtered at the Niono abattoir between 1979 and 1980 were females. He attributed the greater number of females slaughtered to the much greater demand for male animals for export in the case of cattle and sheep, and also to the demand for work ox. Male animals are known to better withstand the rigours and stresses of work and long distance transportation.

Wilson (1986) observed that at the Niono abattoir, for all species, the females slaughtered were generally in the old age ranges having outlived their useful reproductive life. The age ranges of the camels slaughtered here were not determined but it is felt that for 13% of the females being slaughtered to be pregnant is rather high and it is probable that not all these females had outlived their reproductive life. Pregnancy diagnosis by the veterinary would go a long way in limiting the number of pregnant animals being slaughtered. Farmers could also be encouraged to save such pregnant animals through subsidies and compensations.

The population of the dromedary camel in Nigeria is not much - only about 18,000 - (FAO, 1980). A more recent estimate (Bdlya,1990 unpublished) put the camel population in Borno State of Nigeria at about 30,000. This is about 67% more than the FAO (1980) figure of 18,000 which was for the entire Nigeria. It is not known what proportion of the camels slaughtered in Nigeria actually originate from Nigeria or from the neighbouring countries of Cameroon, Chad Niger or even sudan. What is known is that during the dry seasons (Igene and Alaku, 1984) and under drought conditions (Jiya, 1974), as happened between 1969 and 1973, much of the livestock slaughtered in Nigeria actually originate mainly from these neighbouring countries. During that drought also cattle from Niger Republic were seen grazing as far down

TABLE 2. ANNUAL RAINFALL[1] AND CAMEL SLAUGHTER IN MAIDUGURI (1979 - 1989)

Year	Rainfall (mm)			Camels Slaughtered	
		Deviation from mean (%)			
	Yearly Total	1915 - 1989	1979 - 1989[2]	Yearly Total	Deviation from mean (%)
1979	711	+09	+51	na	-
1980	621	-04	+32	na	-
1981	461	-29	-02	na	-
1982	234	-64	-50	5319	-42
1983	283	-56	-40	3001	-67
1984	328	-50	-30	14156	+55
1985	416	-36	-12	19284	+111
1986	503	-23	+07	11386	+2
1987	366	-40	-22	6838	3
1988	628	-03	+34	8597	05
1989	607	-06	+29	4618	-50

Source : [1]Thambyahpillay (1987); [2]Calculated from 1; na = not available.

the sub-humid zones of Nigeria as Benue and Kwara states (Jiya, 1974). The authors choose to think that both the 18,000 and 30,000 are actually underestimates of camel population in Nigeria. If the above estimates are taken to be correct the slaughter of 19,285 camels in 1985 alone could have led to collaps of the camel production aspect of our livestock industry notwithstanding the number imported from the neighbouring countries of Cameroon, Chad and Niger. A very well organised livestock census in Nigeria is long overdue.

Year of slaughter showed highly significant ($P < .01$) influence on the number of camels butchered within the decade under study. The slaughter figure (19,285) for the year 1985 alone represented about 26% while the number butchered within the three years of 1984/1986 represented up to 61% of the total slaughter for the study period.

Table 2 shows the trend in annual slaughter in relation to that of the total annual rainfall in Maiduguri within the decade.

The peak year of drought, 1983, was not itself marked by large slaughter of camels. Huge offtake started occuring probably due to the persistence of drought in subsequent years climaxing in the largest number by 1984/1986. By the very end of the 1980s precipitation improved appreciably and that probably resulted in the observed sharp drop in the number of camels available for slaughter.

Though drought may be difficult to predict but the results of this study strongly suggest that offtake of livestock, and especially of camels for trade and slaughter, could be a very good barometer for determining the pangs of the adverse climatic conditions in the arid and semi-arid environments of sub-sahelian Africa. According to Professor Reuven Yagil of the Ben Gurion University in Israel (Anon, 1989) "the camel is the only domestic animal truely adapted to arid and semi arid lands. It can survive on desert scrubs with little water, and continue to produce milk when cattle are dry and dying" Huge sales as observed in the mid 1980s must have been due to actual stress in the environments.

It has become imperative that our animal breeders, nutritionists, ecologists, economists and policy makers should accord our draught animal, and especially the camels, the recgnition due them in our animal production programmes for various reasons. Apart from being sources of transportation, recreation and other odd applications, the camel is a good source of meat.

Earlier studies here (Igene and Alaku, 1984) revealed that from 1973 to 1982 an average of 39,004 cattle were slaughtered annually in Maiduguri abattoir. Estimated total carcass yield from this number was 7,215,648kg of beef per annum. The present study shows that an average of 9,150 camels were slaughtered annually for the period of study. This gave an estimated carcass yield of about 2,596,397kg of camel meat per annuam.

On the average our bull/steer weighs about 350kg with a dressing-out percentage of about 50% (Nuru, 1982). An average dromedary camel on the other hand weighs from 454 to 590kg (Williamson and Payne, 1978). This range gives a mean of 522kg for a live camel. Various authorities have given different dressing percentages for the dromedary camel viz: 54 -57% (Congui,1953), 57% (ITV, 1973), 56 - 57% (Dina and Klintegerg, 1977) and 41.3 - 55.6% (Wilson,1978). From these figures, an estimated mean of 54.36% was calculated and used for the camel in this study.

When the yield obtained in this study is compared with that from cattle (Igene and Alaku, 1984) it is clear that about 27,000 camels or less would be slaughtered to yield an equivalent amount of meat or more as did the 39,000 cattle. Though it is not clear whether the dromedary camel is capable of sustaining higher dressing out percentages under all management and econological systems (Mukasa-Mugerwa, 1981) it is known to have higher percentages than the pastoral cattle (Dahl and Hjort, 1976) It is really a matter of great concern that neither the government nor our research institutions has any programme that aims at intergrating our draught animals. Even the most recent directive by the National Universities Commission NUC (1989) to make the Nigerian Universities adopt programmes that would serve our national inter-

est was completely silent about our draught beasts. Courses in animal production are still focused on cattle, sheep, goats, poultry and rabbit. One would have expected the NUC to issue directives to the Faculties of Agriculture and especially those in the sudano-sahelian ecosystems of nothern Nigeria to develop their curriculum to embrace the studies on uses and breeding of horses, mules, donkeys and the dromedary camel.

Most areas of the sudano-sahelian environment are sandy and completely inaccessible with even the best made 4 - wheel drive cars but not when camels, horses and asses are used. Most effective coverage of the environment has always been achieved with these beasts for the purpose of border patrol, electioneering, innoculation and immunization campaigns as well as for national census.

The earlier we realise that our research programmes and animal production projects do not have the same objective as those of the more advanced countries the better for us. Animal Producton in Nigeria is not to be thought of only in terms of meat, and probably, milk supply. As a developing nation, Nigeria needs all the resources obtainable from our draught animals and we cannot realise these without developing these animals.

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