

THE POTENTIAL FOR THE STRATIFICATION OF THE CATTLE INDUSTRY IN CAMEROON AND CENTRAL AFRICA

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IV. In the past, West and Central African Consumers have enjoyed very low red meat prices in relation to international prices. The low producer prices and the low productivity of African breeds of cattle have resulted in a slow rate of technical progress and modernization in meat production and marketing.

Because demand has been and will continue to grow faster than supply, red meat prices can be expected to increase from 5 to 10 percent per year for the indefinite future. In contributing to the unfavorable supply projections is the shrinking overgrazing of range lands available for grazing, range deterioration resulting from overgrazing and the need to rebuild herds after the drought in traditional supply areas.

However, rising prices for cattle can be expected to increase the profit potential of a variety of development programs including fattening schemes and small producer development programs. The derived Savanna zone of Cameroon could become a center for intensive cattle production at the projected price levels.

RESUME

Possibilités de structuration de l'industrie du bétail au Cameroun et en Afrique Centrale

Dans le passé, les consommateurs d'Afrique de l'Ouest et du Centre ont bénéficié de prix très bas pour la viande rouge, par rapport aux prix internationaux.

Le prix faiblement rémunérateur et la faible productivité du bétail africain ont entraîné un progrès technique très lent ainsi qu'une modernisation de la production et de la commercialisation de la viande faibles.

Parce que la demande s'accroît plus vite que l'offre, on doit considérer que les prix de la viande rouge augmenteront de 5 à 10 p. 100 par an, pendant une période indéterminée.

Le rétrécissement des surfaces des terres disponibles pour le pâturage, la destruction des savanes par le surpâturage et la nécessité de reconstituer les troupeaux après la sécheresse dans les régions traditionnelles de production contribuent aux perspectives défavorables de l'approvisionnement.

Toutefois, l'augmentation des prix du bétail doit être considéré comme accroissant la possibilité de profit d'une variété de programmes de développement, incluant des plans d'embouche et des programmes de développement de petit élevage. La zone de savanes du Cameroun peut devenir un centre de production bovine intensive aux niveaux de prix prévus.

Introduction

It is a fact that animal production and marketing systems in West and Central Africa have changed very little over the past half century. Most cattle are still managed under centuries old husbandry practices and a majority of cattle are still marketed on hoof. While some improvements in productivity have resulted from vaccination and treatment campaigns, calf and adult mortalities remain high and national herd extraction rates are usually stated to be less than 10 percent per year.

An historical analysis of cattle numbers, rate of herd increase, average weight, age at sale and the like is difficult because of lack of data. However,

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there is growing evidence that the average age and weight of cattle are being consumed. Taking West and Central Africa as a whole, the majority of breeding herds are in the Sahil and Savanna vegetation zones. In these zones, the increasing incidence of overgrazing resulting from overstocking and the expansion of land under cultivation work against further productivity increases. Malnutrition and starvation are now the direct causes of low productivity. The cattle population is believed to have declined sharply in most cattle exit areas.

Non economic reasons are often emphasized for the underdeveloped state of production and marketing — traditional producers, anarchic marketing systems, and the like. However, it is evident that the difficult climate, uncontrolled disease, and more importantly, the very low cattle and meat prices in production areas that have constrained modernization and growth of meat production. Meat price differentials between West African and European production areas have historically been on the order

of 300-500 percent. Sanitary regulations, high transport costs, export and import controls, discouraged exports of meat to markets outside the Region except as low value processed meats.

In addition to low meat prices, low average incomes also influenced the structure of the demand for beef. Low income consumers usually cook meat by boiling and therefore tenderness is of minor importance to a majority of consumers. In the total demand picture, there is only a comparatively small market for « quality meat at premium prices » for an elite clientele. This market has been supplied by the occasional animal of superior finish, the few « commercial » ranches and by meat imports. Because quality differentials are not important, premium prices in production areas are paid for the 5-6 year old steer which loses less weight in the marketing system. In short, the underdeveloped state of West and Central African countries, low effective demand and low producer prices which when combined with the low inherent productivity of African breeds of cattle, have resulted in the continuation of land and capital extensive and labor intensive production and marketing systems. Intensive feeding to improve quality has not been profitable because of small or non-existent price differentials for finished stock combined with the lack of low cost concentrate feeds at economic prices.

For these reasons, the stratification of production and marketing into ranch and fattening sectors has not developed in West Africa. Although West and Central African consumers have enjoyed low beef prices, it has been at the expense of growth and modernization of beef production. Recent pre-drought supply projections based on assumptions which now must be considered extremely optimistic, projected supply deficits for West Africa (Senegal to Nigeria) of 262,000 metric tons, and 100,000 metric tons for Central Africa (Cameroun - Zaire) by 1980. This is the equivalent of 2 million head of cattle per year. Based on modest assumptions of economic growth and population growth rates, demand for red meat will continue to grow at 8-10 percent per year. Red meat prices have doubled and even tripled in

most West African urban markets in the past 6-8 years. Should current price and supply trends continue, West African meat prices could approach those of Europe within 10-15 years. It is unrealistic to anticipate a substantial importation of meat to meet supply deficits because of the increasingly tight world supply and demand situation. The double effect will be to price low income consumers out of the market for beef and shift consumption increasingly toward an elite, quality meat oriented markets. While an unhappy forecast for consumers (and governments responsive to cost of living indexes) it will open new development and income possibilities for both conventional meat producers and introduced ranching and feedlot sectors. It does point out the necessity of giving increasing emphasis to both livestock development and to low cost alternatives to beef as a protein source in the diets of low income consumers.

Because the majority of cattle and breeding herds are in Sahil and Savanna zones where overgrazing constrains growth of cattle numbers, any significant short run expansion of meat supplies must come from improvements in the productivity of existing conventional herds. One possibility to improve the meat supply is to increase the average carcass weight of cattle before slaughter either under improved grazing conditions or feedlot operations. Large scale feeding operations appear unfeasible in the Sudan and Sahil Zones because of the absence of low cost concentrates, year round grazing and distances to coastal markets where prices are highest (DE WITT, 1972). In the Derived and Guinea Savanna Zones, unused land is available, rainfall levels higher and distances to consumption centers are less and they would appear to offer the preferred sites for growing out and feed lot operations. In the longer run, these zones can be expected to graze a growing percentage of national breeding herds.

This paper is a preliminary analysis of the potential for the evolution of new production marketing systems in Cameroun in response to rising cattle and meat prices and the evolving demand for quality meat.

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Cameroon

Principal vegetation types and areas by production and marketing region

Latitude (Degrees)	Vegetation Type	Estimated Area (km ²)	Per cent Total Land Area (p.100)
	<u>Region I</u>		
11-12°	Sahelian zones	35,000	7.5
10°	High altitude Sudan Group	7,000	1.5
9°	Sudano-Tree Savanna (Benue Valley)	58,000	12.5
	<u>Region II</u>		
8°	Sudano-Tree Savanna (Adamawa)	58,000	12.5
5-8°	Sudano-Guinea Transition and derived Savanna zones	85,000	18.1
4-5°	Semi deciduous forest zones	55,000	11.7
5-6°	High altitude Grasslands (over 1,200 M)	10,000	2.1
2-5°	Deciduous and Semi deciduous forest zones	160,000	34.1

Vegetation Type Area estimated graphically from "Map of Vegetation", Atlas du Cameroun (IRCAM et OSTRAM, Yaoundé, 1982).

Cameroon production and marketing regions

Africa (see Table 1). Within a geographic area of 470,000 square kilometers extending from 2° - 13° North

The climatic and vegetation belts of Cameroon are found in 17 phytographic regions, 8 distinctive vegetation types and 8 climatic zones (CAME-

ROUN, 1960 ; CAMEROUN, 1972 ; LETOUZEY, 1968). The human population was estimated to be 6.1 million and the cattle population 2.4 million head in 1972 or 0.4 cattle per person.

Cameroon can be conveniently divided into two distinct cattle production and marketing regions. *Region I, Nord Cameroon* lies north of the Adamaoua Plateau at an average elevation of about 300 meters. It is separated from *Region II, South Cameroon* by a « Cordon Sanitaire » which is maintained cattle free in order to prevent the spread of contagious Bovine Pleuro Pneumonia (C.B.P.P.) into the Adamaoua Plateau. The cattle free belt parallels the Adamaoua escarpment and effectively prevents the movement of any trade cattle from Northern Cameroon Markets to the South. The predominant vegetative types of Region I are the Sahelien, the Sudano-Tree Savanna (Benue valley) and a small area of High Altitude Sudan vegetations. They represent an estimated 101,000 square kilometers or roughly 22 percent of the land area. Cattle population of Region I is estimated to be between 900,000-1 million head, and the cattle density per area averages only one animal per 10 hectares, but cattle are concentrated in the Tsetse Fly free areas away from game reserves and game parks. With present patterns of land use, it is improbable that the cattle population will expand beyond the 1 million head level.

Region I is part of the larger Northern Nigeria/Central Chad, production and marketing region. A sizable but unknown number of cattle from Chad are trekked across Northern Cameroon to markets in Nigeria. Fewer trade cattle are believed to exit to Nigeria then enter from Chad adding to the Cameroon meat supply. Cattle fattening opportunities are not considered great because of distances to markets. They are being investigated by the Lake Chad Basin Commission, and are not considered in this paper (HENRY, 1971).

Region II, The South Cameroon Production and Marketing Region, includes roughly 75 percent of the human population and land mass and 60 percent of the cattle population.

Cattle production occurs in three contiguous production subzones which form a belt across central Cameroon (Map). The zone designations and cattle cattle populations are the following :

Subzone	Head
Adamaoua	1,000,000
West	280,000
East	120,000
Total	1,400,000

The *Adamaoua Zone* and *West Zone* are without parallel as grazing areas in Western Africa. These well watered uplands at elevations of 1,000 to 2,000 meters provide excellent grazing for 8-9 months of the year. They correspond approximately to the Sudano-Tree Savanna (Adamaoua) and High Altitude Grasslands vegetation types respectively listed in Table I. These vegetation types make up roughly 70,000 m² or 15 percent of the land mass. Average cattle density is roughly 5.5 hectares per animal. The elevation moderates temperatures sufficiently to permit a variety of livestock development possibilities including dairy production in the West Zone. There are several commercial ranches in the Adamaoua zone with breeding herds and growing out operations. The Government currently has plans for additional large ranches and some small rough development, in the Region.

The *East Zone* is a recent extension of the Adamaoua Zone into Guinea Savanna and Derived Sa-

vanna vegetation areas at slightly lower elevation as the result of beginning overgrazing in the Adamaoua Zone and the advance of the Tsetse Fly in the North-west sector of the Plateau.

The 1.4 million head in the three zones are managed almost exclusively by semi-nomadic Fulani and Mbororo cattlemen. The Fulani have permanent villages and the Mbororo permanent but movable camps but both migrate with their herds off the central uplands into dry season grazing areas. Both groups now grow a significant share of their food requirements near home camp areas and both sell or barter milk for part of their subsistence needs (DEEN, 1972). Because grazing is excellent at least 8 months of the year overgrazing is yet a localized problem, cattle marketed in South Cameroon are generally larger and better fleshed than Western African trade cattle taken as a whole.

Although overstocking problems are in general not yet unmanageable and the cattle population is still expanding, there are some areas of range resource degradation near human population centers in central and eastern Adamaoua Province and in the West subzone. There are on the other hand, extensive areas in Southern and Western Adamaoua and in Guinea Savanna areas to the South which are rarely grazed by cattle owners. The apparent reasons for under grazing are the lack of roads and infrastructure and population concentrations that provide entertainment, starchy staple foods and supplies for the herdsman's families and, most importantly provide markets for part of the milk production from herds.

With the exception of the East Zone, the Guinea and Derived Savanna areas of Cameroon are sparsely inhabited and are only partially used for grazing. The estimated area of these two vegetation types is roughly 85,000 km² or 18 percent of the land area. Most trade cattle traverse this area on route to markets concentrated in the Forest areas. The prospects for expanding production either by growing out or fattening projects or by grazing an expanded national herd are discussed in more detail in a following section.

The forest belt of Cameroon supports no cattle production of importance and cattle production is not likely to develop in the near future. The forest belt in Cameroon is roughly 48 percent of the land area or some 235,000 km² (Map and Table 1).

Cattle numbers and productivity

Because no census of total cattle numbers has been carried out, only the subjective estimates of the cattle population by veterinary Department staff are available. These are based upon Jungali cattle tax in the West, vaccination and treatment records and the veterinary staff personal knowledge of the herds. The 1972 population estimate for the South production region of 1.4 million head is the end product of such estimations. Estimates of the cattle population over time for Adamaoua are included as part of Table 6. No records of the cattle population in the East and West subzones overtime are available.

The age/sex structure of the herds has been documented by two sample censuses of the herds of the Adamaoua Zone conducted in 1964 and 1971. The earlier census, carried out under the sponsorship of FAC, involved a small sample of herds in the Ngaoundere area (LACROUTS, 1965). The 1971 census involved a survey of some 66,000 head visiting vaccination centers throughout the Adamaoua Zone (DEEN, 1972). The age/sex breakdown from the two censuses are compared in Table 2.

Adamawa : Age sex structure of herds 1964 and 1972 (Percent)

Sex	F A O 1964 (a)	Ministry of animal husbandry 1972 (b)
Females		
Cows 3 +	38.5	40.5
Heifers 9 months-3.5 years	20.4	18.1
Subtotal	58.9	58.6
Males and castrates		
+ 5 years	8.1	10.7
9 months-3 years	18.1	15.1
Subtotal	26.2	25.8
Calves		
Female	-	8.9
Male	-	7.1
All Calves	15.0	15.5
TOTAL	100.0	100.0

(a) M. Lacroix et J. Sarriguat, *Le Cheptel Bovin du Cameroun, Exploitation, Commercialisation, Perspectives d'Avenir* (Paris, Ministère de la Coopération, 1965)

(b) D. Deen and D. Johnson, Eds., *Beef Cattle Production on the Adamawa Plateau* (U.S. Peace Corps in Cooperation with the United Republic of Cameroon, Ministry of animal husbandry, 1972)

South Cameroon production region
Estimated numbers of cattle by age and sex category, 1972*

Age/Sex Category	Percent	Total Numbers
<u>Females</u>		
Cows +3.5 years	40.5	567.000
Heifers 9 months-3.5 years	18.1	253.400
Subtotal	58.6	820.400
<u>Bulls and steers</u>		
Bulls 9 months-3.0 years	13.4	187.600
Bulls +3.0 years	5.5	77.000
Steers 9 months-3.0 years	1.7	23.800
Steers +3.0 years	5.3	74.200
Subtotal	25.9	362.600
<u>Unweaned Calves</u>		
Females	8.4	117.600
Males	7.1	99.400
Subtotal	15.5	217.000
Total herd	100.0	1.400.000

* Age sex estimates from ; D. Deen and D. Johnson Eds., *Beef Cattle Production on the Adamawa Plateau* (U.S. Peace Corps in Cooperation with the United Republic of Cameroon Ministry of animal husbandry, 1972). Assumes a total cattle population of 1.4 million heads.

Taking into account differences in sample size and category definition, the two censuses agree closely as to the percentages of animals in each category suggesting that the composition of the zonal herd has changed very little over the recent past. They indicate that roughly 59 percent of the cattle are heifers and cows, 26 percent males and castrates and 15 percent unweaned calves. A more complete age/sex breakdown of the 1971 census is included in

Assuming that the age/sex structure is similar in the East and West subzones, an estimate of the total number of cattle in each category in the South pro-

duction Region is given in Table 3. The larger numbers of cows and heifers in relation to males and castrates indicates that few «surplus» males are retained in herds for non-economic reasons. The census indicates that there are significantly more female calves than male calves in the herds. The higher survival rate for females can only be explained on the basis of herdsmen valuing female calves over male calves because of their greater future contribution to family income and thus presumably allowing females more of the dam's milk supply. Higher male calf mortality is a common feature in semi-pastoral herds throughout Africa and must be con-

sidered in estimates of meat supply and proposed development programs (FERGUSON, 1973).

Estimates of herd productivity factors consistent with the census data and cattle marketings are included in Table 4. These include, calving percentage, 60 percent; calf mortality, 25 percent (30 percent female and 20 percent males mortality); effective weaning rate, 45 percent; and estimates of immature and adult mortality. Using the above productivity estimates, the number of cattle theoretically available for slaughter, after allowing for a 1.5 percent rate of growth in the cattle population, are shown in Table 4. The projections suggest the

following theoretical slaughter from a cattle population of 1.4 million head:

	Males	Females	Total
Potential mature sales	86,100	73,600	159,700
Growth of herd at 1.5 p.100	- 7,300	-14,000	-21,000
Available for marketing (Adults)	78,800	59,600	138,400
Immature sales (less than 3 years)	+15,000	+ 1,000	+16,000
Available for marketing	93,800	60,600	154,400

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South Cameroon production region
Estimates of productivity and theoretical commercial and marketed extraction rates, 1972* (1 400 000 Heads)

	Males	Females	Herd
<u>Productivity Estimates</u>			
Calves born per year	170,100	170,100	340,200
Calves surviving weaning	119,100	135,100	254,200
Mortality 8 months-3.5 years	-18,000	-21,800	-39,800
Slaughter 8 months-3.5 years	-15,000	- 1,000	-16,000
Annual entering adult herd	89,100	113,300	202,400
Mortality adult herd	- 3,000	-39,700	-42,700
Potential adult sales	86,100	73,600	159,700
Growth of herds 1.5 p.100/year	- 7,000	-14,000	-21,000
<u>Theoretical slaughter</u>			
Adult	76,100	59,600	135,700
Immature	15,000	1,000	16,000
Total extraction	91,100	60,600	151,700
<u>Productivity factors assumptions</u>			
Calving percentage (p.100)	30.0	30.0	60.0
Calf mortality "	30.0	20.0	25.0
Effective weaning rate "	42.0	48.0	45.0
Immature mortality "	7.0	7.0	7.0
Mature mortality "	2.0	7.0	5.9
Commercial extraction rate "	-	-	12.3
Marketed extraction rate "	-	-	10.8
Growth of population "	-	-	1.5

* Productivity estimates and estimated extraction rates consistent with known census composition and recorded sales.

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South Cameroon Production region
Estimates of animals available for slaughter prices and producer income by age and sex of animal, 1972

	Percent of Sales ^a	Average Price 1971 ^b	Average Price 1972 ^b	Estimated Slaughter 1972 ^c	Estimated Value 1972 (Thousands)
<u>Males</u>					
Bulls	22.1	19,119	22,375	29,440	658,770
Steers	35.2	20,453	28,391	46,670	1,330,840
Young Bulls	11.1	5,355	9,773	14,790	144,543
Subtotal	68.4	-	22,395	91,000	2,040,202
<u>Females</u>					
Cows	31.2	12,344	15,437	41,560	643,102
Heifers	.4	-	15,000	.530	7,850
Subtotal	31.6	-	-	42,090	650,952
Grand Total Average	100.0	15,930	20,528	133,190	2,731,154

^a D. Dean and D. Johnson, Eds., Beef Cattle Production on the Adamaoua Plateau (US Peace Corps in Cooperation with the United Republic of Cameroon, Ministry of animal husbandry, September 1972).

^b Unpublished Records, Ministry of animal husbandry.

^c Assumes sex and age breakdown of sales in official markets are the same as actual slaughter and a cattle population of 1.4 million heads

The data suggest that roughly 79,000 males over 3 years and 15,000 «immature» males are available for slaughter each year. To this can be added roughly 60,000 cull heifers and cows. The estimated «commercial extraction rate» (cattle retained in the herds plus those slaughtered) is 12.3 percent and the «market extraction rate» (commercial rate less herd expansion) an estimated 10.8 percent. The extraction rate estimates, while low by European standards, are 2-3 percent above those usually reported for West Africa. The commercial extraction rate estimate of 12.2 percent does not appear to be unseasonable given the superior grazing conditions currently existing in the Region.

Data is also available on the actual age/sex ratio and prices of cattle sold in official Adamaoua markets (Table 5). A second estimate of theoretical slaughter based on the age/sex ratio of cattle sold is given in column 4 of Table 5 and are compared with those in Table 4 below:

	Theoretical slaughter	
	Table 4	Table 5
Bulls and steers mature	76.100	76.300
Bulls immature	15.000	15.800
Subtotal	91.100	91.100
Cows and heifers	60.600	42.100
TOTAL	151.700	133.200

It should be noted that productivity estimates in Table 4 were constructed to be consistent with the data on marketing in Table 5. However, the ratio of the number of females to males in the estimated availability for marketing (Table 4) does not coincide with the ratio of females to males actually sold in Adamaoua markets. (Table 5). The reasons that they do not coincide is that some cull females are slaughtered without passing through official markets.

The two estimates do tend to confirm a range of theoretical availability for slaughter at between 135,000 and 152,000 head for the South Production Region and establish the theoretical maximum number of male cattle for growing out and fattening at 90,000 head. The price data suggest that the revenue to the production zones from the sale of cattle in 1972 was roughly CFA 2.73 billion (\$ 130 million).

To summarize, productivity data based on the 1971 cattle census, suggest that the maximum number of cattle available for marketing in each subzone are the following:

Subzone	Bulls and Steers		Cows and Heifers	Total
	Mature	Immature		
Adamawa	54.360	10.710	43.290	108.360
East	6.520	1.290	5.190	13.000
Subtotal	60.880	12.000	48.480	121.360
West	15.220	3.000	12.120	30.340
TOTAL	76.100	15.000	60.600	151.700

Of the cattle available for marketing, some are slaughtered in the production zones and the rest are exported to other areas. The records of the Ministry of Elevage indicate that nearly all of the cattle produced in the West subzone are consumed locally or in nearby population centers and few if any, enter the flow of trade cattle to urban markets.

The Adamaoua Zone exports 70-80 percent of available cattle to other consumption areas. Data on local slaughter within the Zone and cattle exported on hoof and as carcass meat for the period 1954-1971 are given in Table 6. Comparing potential availability with recorded marketing 90-95 percent are accounted for in official records. Of the total, some 25 percent of available cattle are consumed within the zone, 6-8 percent are slaughtered locally for export by air, and 68 percent are exported on hoof

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Adamawa zone
Cattle slaughtered recognized markets
and exported controlled marketing channels, 1954-1971

Year	Recorded Slaughter Adamawa	Exported live on Hoof and Truck	Exported Carcass (Air)	Total Recorded disposal	Extraction Rate	Cattle Population (1000's)
54	7,604	53,997	4,043	65,594	7.9	835
55	8,154	55,086	5,543	68,783	8.1	850
56	8,317	57,169	4,848	70,154	8.1	856
57	8,701	64,730	4,002	77,423	8.6	880
58	8,396	77,242	4,806	91,444	10.4	890
59	9,257	69,045	5,038	83,340	9.5	875
60	9,686	44,780	5,043	59,509	6.8	875
61	9,937	61,361	7,183	78,481	8.7	900
62	10,251	57,396	4,960	72,607	8.0	110
63	12,823	64,499	4,457	81,779	8.8	925
64	13,390	55,041	4,721	83,152	8.8	940
65	12,750	58,249	3,884	74,883	7.9	950
66	13,647	65,115	3,232	81,994	8.5	950
67	11,549	71,272	3,701	86,522	9.0	920
68	17,025	69,159	2,874	89,058	9.1	980
69	18,804	66,880	3,580	89,272	8.9	1000
70	20,136	64,582	5,106	89,734	8.5	1025
71	24,384	79,400	8,699	112,493	10.2	1050

Source of Data for 1954-1967, various Governmental documents; Data for 1968-1971, D. Dean and D. Johnson, Eds Beef Cattle Production on the Adamawa.

or by truck transport. Of the 70-80,000 head exported from Adamaoua, roughly 30,000 follow a trade route through eastern Cameroon; 20,000 a trade route from Central Adamaoua to Yaounde;

and, 20,000 trade route to Yaounde originating in eastern Adamaoua and the East Zone.

Possible error in the beef availability estimates which follow results from the fact that herdsmen

Cameroon
Estimated production of beef and offals and producer prices
and income by production region, 1972

	Region I	Region II			Total Cameroon
	North	Adamawa Zone	West Zone	East Zone	
Cattle Population (No.)	900,000	1,000,000	280,000	120,000	2,300,000
Production Factors					
Extraction Rate (p.100)	10.0	11.0	11.0	11.0	10.6
Average Carcass (kg)	100	160	160	160	138
Offals percent (p.100)	25	25	25	25	25
Beef Supplied					
Cattle Availability (No.)	90,000	110,000	31,000	13,000	244,000
Carcass and Offals (Tons)	11,250	22,000	6,200	2,600	42,050
Farm Income					
Price per Animal (CFA)	12,000		20,500		
Price/kg live (CFA)	80		65		
Regional Income (M.CFA)	1,080		2,730		

and cattle traders do not respect international boundaries any better in Cameroon than they do elsewhere in Africa. It is not known if there is a net flow of herds and cattle into or out of neighbouring areas of Central African Republic and Eastern Nigeria. The net flow at the present time in either direction is believed to be insignificant (1). Two Thirds of the 5-8,000 carcasses exported by air from Ngaoundere do leave Cameroon for Markets in Congo and Gabon more than offsetting a small meat importation. For the purposes of this supply analysis, the South Production and Marketing Region can be considered « self sufficient » in beef production, however, at very low per capita levels.

Supply and demand projections

Estimates of the production of carcass meat (with bone) and edible offal for 1972 by zone is given in Table 7. The assumptions used in making the estimate are included in the Table. The data suggest a

current national production of 33,640 Tons of carcass and 8,410 Tons of edible offal. Neglecting imports and exports from other countries, the estimated production per capita by region is the following :

	Human population	Carcass and offals	Per capita availability
	(Thousands)	(Tons)	(kg)
<u>Region I, North</u>			
Total	1,418	11,250	8.8
<u>Region II, South</u>			
Production zones	975	10,000	10.3
Consumption zones	3,715	20,800	5.4
Total Cameroon	6,108	42,050	6.8

(1) In the early 1960's as many as 15,000 head left West Cameroon for markets in Nigeria (FERGUSON, 1967). Any sizable differences in trade cattle prices would probably result in a renewal of trade in uncontrolled border areas.

Cameroon
Estimated cattle population and total and percapita beef production
1972, 1975, 1980 and 1985

	1972	1975	1980	1985
<u>National Herd</u>				
(Thousand Heads)				
<u>Region I</u>				
North	900	950	1,010	1,010
<u>Region II</u>				
Adamawa	1,000	1,090	1,180	1,270
West	280	306	330	355
East	120	135	150	165
Subtotal	1,400	1,531	1,660	1,790
TOTAL Region I and II	2,300	2,481	2,670	2,800
<u>National Production</u>				
(Metric Tons)				
Region I	11,250	11,800	12,600	12,600
Region II	30,800	33,880	36,520	39,380
Total	42,050	45,680	49,120	51,980
<u>Human Population</u>				
(Thousands)				
Total	6,108	6,450	7,120	7,880
<u>Production percapita</u>				
(kg)				
Average	6.80	7.00	6.90	6.60

Source of data for 1972, this study. Data for 1975, 1980 and 1985 adopted from : SEDES, Approvisionnement en viande de l'Afrique Centrale (Paris, 1971). The SEDES estimates of the growth of the North Cameroon herd has been revised downward to a zero growth rate post 1985. Projections assume extraction rate at a permanently sustainable, 10 per cent in North and 11 per cent in South and weight of animals remains unchanged over time.

The data suggest that the current percapita availability of carcass meat (with bone) plus offal is 8.8 kg in the North, 10.3 kg in production zones of the South and 5.4 in the South consumption zones. Consumption per capita is known to be considerably higher in urban areas. While subject to a considerable margin of error, the data do indicate the modest level of availability and the potential to expand consumption should supplies increase.

A summary of the 1972 estimate and projections of the cattle population, total national production, and percapita production for 1975, 1980 and 1985 by Region are given in Table 8. The projections in Table 8 are adopted from earlier projections by S.E.D.E.S. (TYC, 1971) (2). The extraction rate and average carcass weight are assumed to remain the same but the cattle population of Region I, will level off at 1,010,000 head after 1975 and that of Region II is projected to grow 1.5 percent per year. Of particular interest, the percapita availability of meat is projected to decline post 1975.

The demand projection for the Cameroon market for beef appear to be a fair estimate of the growth of demand at 1969 prices. The S.E.D.E.S. projections consider urban and rural population growth and the supplies of other animal proteins in their projections :

	National production (tons)	Demand 1969 prices (tons)	Deficit (tons)
1969	42,510	48,221	5,711
1975	43,630	56,285	12,655
1980	47,520	64,807	17,287
1985	51,645	76,910	25,265

The S.E.D.E.S. projections suggest that demand for beef will increase 60 percent in 16 years and national production by 21 percent and the « deficit » in production from 5.7 to 25 thousand tons. Because it is unpolitic to predict future price increases, S.E.D.E.S. optimistically assumed that the deficit could be imported, presumably from Chad, and prices would remain unchanged. As Cameroon prices are yet below world prices and those in urban markets of neighbouring countries, importations to cover more than a fraction of the « deficit » appears unlikely. In fact, exports of carcass meat from Adamaoua to Congo, Gabon and Equatorial Guinea are increasing because of price differentials and the Cameroon Ministry of Elevage is considering the imposition of export quotas to these markets. It should not be necessary to emphasize that « consumption » cannot exceed availability of beef in the Cameroon market.

Documenting past price trends and projecting future trends is particularly difficult because of normally « fixed » urban meat prices which appear to change little over considerable periods of time. Second, few cattle are weighed at the time of sale. Thus, it is impossible to know if the « average » animal sold is of the same weight and confirmation in 1973 as it was 15 years ago. A more systematic price recording and reporting system for cattle and meat prices in urban and rural areas is urgently needed for rational development planning and price policy.

Scattered price data suggest that cattle prices and retail prices have increased roughly 60 percent between 1964 and 1972 to present levels of CFA 300 for boneless meat (Yaounde) and CFA 20,500 per average animal sold (Adamaoua markets, Table 5). With the

(2) A more modest expansion of the cattle population in Region I and a slightly higher average carcass weight in Region II have been used.

rate of demand growth accelerating, and availability percapita declining it appears reasonable to foresee price levels increasing by not less than 60 percent by 1980. This would conservatively place average boneless meat prices (Yaounde) at CFA 480/kg and average Adamaoua cattle prices at 33,000 per head by 1980. It is reasonable to assume that rising prices and shifting demand patterns will make cattle production and fattening increasingly economically attractive in Central Africa.

The prospects for accelerating supply expansion

The preceding analysis suggests that South Cameroon is fortunate in that there are still opportunities to expand cattle numbers within existing production zones. There are also expanding markets for better quality meat not only within Cameroon but in nearby African Countries.

The potential male cattle for feeding must, for the most part, be drawn from the range cattle currently exported on hoof from the Adamaoua and East Zones which follow the central or eastern trade routes. If the approximately 35,000 cattle have the same age/sex composition as those sold in Adamaoua markets (Table 5), the following would be available for feeding :

Bulls	Head 7,800
Steers	12,400
Young bulls	3,800
Females	11,000
	35,000

Thus, the *maximum* potential initial supply of male cattle for feeding is just over 20,000 head. In the longer run, perhaps more of the cattle trekked through Eastern Cameroon to Douala could be diverted through the area and transport to Douala by railroad raising the potential to some 90,000 head. An initial handicap of a feeding scheme would be to develop a system for buying fattening stock which currently does not exist. An obtainable goal might initially be about 5,000 head per year for intensive feeding.

Economic viability

A hypothetical projection of costs and returns for molasses feeding in the Mbandjock area based on experience with zebu feedlots in other tropical areas has been made by PRESTON (PRESTON, 1973), and a second projection based on feedlot trials at Wakwa using average zebu trade cattle available in the Adamaoua zone (LHOSTE, 1973). The Wakwa trials are reported in another paper at this conference.

The PRESTON projections assumed the purchase of animals of an average live weight of 300 kg to be fed for 112 days. Animals are to be fed molasses and cotton seed cake and restricted grazing to assure maximum molasses intake. The expected daily average gain is 0.9 kg and the end weight, 400 kg per animal. The projected requirements and costs, per animal are the following :

Ration requirements	Weight (kg)	Cost per kg (CFA)	Total cost (CFA)
Molasses	1,000.0	2.4	2,400.0
Cotton seed cake	147.0	25	675.0
Salt	3.0	25	87.5
Bone meal	3.3	25	87.5
Grazing	250.0	-	-
Cost Concentrate			6,250

The projected cost of feeding, exclusive of grazing and capital costs is CFA 6,250 per animal. Substituting Dried Brewers Grains for cotton cake would decrease feed costs by roughly CFA 225 per animal.

The revenue projections of PRESTON have been modified slightly to reflect prices for cattle per kilo at purchase and at sale reported for the Wakwa trials. For comparison a projection for 1980, with cattle prices and feed costs assumed to increase by 60 percent is included:

	1973		1980	
	Price per kg. Live wt	Total	Price per kg.	Total
	CFA	CFA	CFA	CFA
Purchase Price (300 kg)	82	24.600	131	39.300
Sale Price (400 kg)	92	30.800	147	58.800
Increase in value		12.200		19.500
Feed cost		6.200		9.900
Margin above Feed cost		6.000		10.600

The projections anticipate a margin above feed cost of CFA 6,000 (\$ 27.20) currently and CFA 9,900 (\$ 45.00) in 1980. It would appear that gross margins are sufficient to allow profitable feedlot operations using molasses as the basic energy component of the ration. Rising prices will improve the profit margin.

Impact on beef marketing

The PRESTON projections suggest that the feedlot period would increase beef yield 48 kilograms per animal or nearly 50 percent.

	KOP p.100	Boneless p.100	Beef (kg)
Begin wt. (300 kg)	50	33	100
End wt. (400 kg)	53	37	148

The impact of feeding 5,000 animals would be to add only 240 tons to total meat supplies and thus would have marginal impact on prices and should present few problems of marketing.

The longer run impact could be more fundamental as a larger share of the male cattle are fattened. More efficient gains are anticipated from younger animals (300 kg) than from the average trade cattle (350 kg). The expansion of the demand for animals at younger ages would increase the value of younger animals and perhaps induce herdsmen to provide more milk and care, reducing mortalities among male calves. It would also permit a modest expansion of breeding herds. Further studies of the basic changes in husbandry made possible by rising prices and the demand for younger animals are required on a priority basis.

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