Price policy induced distortions: undermining incentives to slaughter stall-fed cattle in urban areas of northern Cameroon

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Introduction

1. A common perception among officials in developing countries is that marketing agents charge unjustifiably high prices and receive unduly high profits, to the detriment of consumers (Harrison et al., 1974; Riley and Weber, 1983). Government officials rarely appreciate the functions that marketing agents perform, including assembly of geographically dispersed foodstuffs and livestock products, transportation from production zones to centres of demand, storage, and product transformation. Marketing margins, which are often high in developing countries, are perceived to reflect windfall profits rather than normal returns, high transactions costs, and real transport, handling, storage and interest costs. Empirical evidence of livestock marketing costs in West Africa (Staatz, 1979; Josserand and Sullivan, 1979; Herman, 1983; Holtzman et al 1980) and in East Africa (Reusse, 1982; Evangelou, 1984) generally demonstrate that butcher and trader returns are not excessive, given high real marketing costs, significant risks, and the high opportunity cost of capital.

2. In attempting to protect consumers of livestock products from allegedly exploitative "middlemen," developing country governments often impose price controls at different levels of the marketing chain (Bekure and McDonald, 1985). These prices do not usually allow marketing intermediaries adequate margins within which real costs can be met and a reasonable return on capital, labor and management can be obtained. Price controls, if effectively enforced, typically induce disincentives to produce and market agricultural and livestock commodities. Low or negative returns in markets with controls encourage diversion of supplies to markets where enforcement is lax. Parallel markets emerge, as in Tanzania (Ferris and Stokes, 1976; Sullivan, 1984) and Uganda (FAO, 1980), in which livestock and meat prices are well above price ceilings, and supplies available at artificially low prices are often rationed. Supplies may even be shipped to foreign markets, leaving insufficient quantities and lower quality produce in local price-controlled markets, as in Tanzania in the 1970s, or imports discouraged from traditional suppliers in the case of Ghana in the late 1970s (Sullivan, 1984). By altering the price discovery and determination process, developing country governments may inadvertently exclude certain groups of consumers from obtaining adequate supplies of wholesome and nutritious foods, although the intent of such interventions is quite different.

3. In the Mandara Mountains of northern Cameroon, government administrators have attempted to protect consumers of beef from rising prices by enforcing retail price controls in urban areas. Officials perceive beef prices and butchers' profits to be too high, to the detriment of consumers. The control prices have been set at low levels in urban areas, encouraging urban butchers to slaughter low quality animals from the Diamare Plains, an adjacent livestock surplus region, rather than well-fleshed, locally available stall-fed cattle. Slaughter of locally produced stall-fed cattle is common in rural areas of the Mandara Mountains where retail meat prices are not controlled.

4. This paper will examine urban butchers' procurement and slaughter practices under the distorting influence of retail price controls in northern Cameroon. An analysis of the costs and returns to butchering and retailing at urban markets will demonstrate that slaughter of stall-fed cattle is generally unprofitable at urban markets where price controls are enforced. This finding has important implications for policy-makers in northern Cameroon, where a World Bank funded project has promoted expansion of stall-feeding. As oil revenues and demand for beef have declined in recent years in Nigeria, which absorbed an estimated 15% of stall-fed cattle offtake from the Mandara Mountains region in 1980, it becomes increasingly necessary to tap

the growing urban markets in Cameroon. This will require removal or relaxation of the retail price controls, so that urban butchers can acquire the locally produced, higher quality stall-fed cattle for slaughter and retail the beef at an acceptable return.

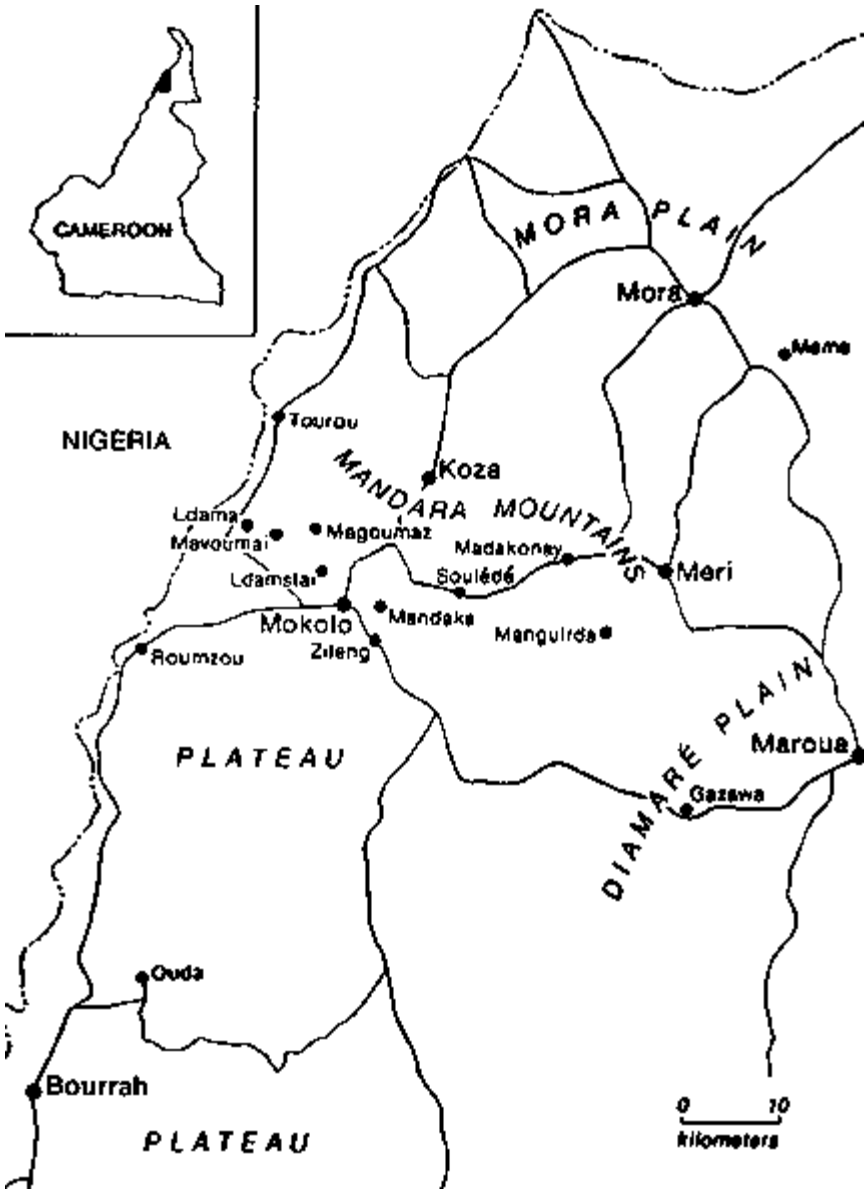
Cattle stall-feeding in the Mandara Mountains Region

5. The Mandara Mountains region of northern Cameroon is one of the more environmentally, agriculturally and ethnically diverse regions of West Africa (Campbell, 1981). It is located in the semi-arid tropics between the latitudes of 10° and 11.5°. This falls within the Sudano-Sahelian belt, a zone which is wetter and more highly vegetated than the Sahelian zone lying to the north. The climate of the region is characterized by a six-month rainy season (May through October) and a six-month dry season (November through April). Figure 1 shows the location of the Mandara Mountains region in northern Cameroon, as well as three geographically distinct zones: the mountains, the plateau, and the plains. The mountainous zone, where stall-feeding of cattle is concentrated, comprises approximately one-third of the land area of the region, which totals 7893 sq. km. Agriculture in the mountains is rainfed, terraced and intensive; holdings are generally less than 2 ha and agricultural and livestock production are highly complementary and well integrated (Holtzman, 1987).

6. The Mandara Mountains are bordered by Nigeria to the west and the Diamare Plains of northern Cameroon to the East. The Diamare Plains are populated by Fulani graziers and their cattle herds. This cattle surplus region supplies the Mandara Mountains region with 30% of its slaughter cattle, which are typically old and infertile cows, as well as over 75% of the bull calves for stall-feeding enterprises. The large cattle markets of northern Cameroon, located in the Diamare Plains, attract cattle from as far away as Chad and traders from other regions of northern Cameroon as well as Nigeria. During the past several decades trade cattle have flowed from east to west, reflecting interregional and international cattle price differentials.

7. Survey research findings show that one in four households (26%) stall-feed cattle in the mountainous zone of the Mandara Mountains region (Holtzman, 1982). There were approximately 13,000 stall-fed cattle in the Mandara Mountains in 1980.[1/] Mixed farmers stall-feed cattle for two to three years on cut and carried forage, dried and stored grasses, and agricultural by-products before sale or slaughter (Boulet, 1975; Holtzman, 1987). The long enclosure of cattle relative to intensive, dry season feeding enterprises in other parts of Africa (Serres, 1969; Thomas and Addy, 1977; Wardle, 1979; Thomas-Peterhans, 1982; White, 1986) is based in part on traditional social practice (see paragraph 9), but has also evolved out of practical need. The mountainous areas of the Mandara region are permanently cultivated; the somewhat incohesive soils on hilly and sloping land are prone to erosion and declining fertility. Cattle enclosure during the growing season is necessary in permanently cultivated areas to prevent crop damage. It allows for capture and composting of manure, which is spread on fields in order to improve soil structure and fertility. Stall-fed cattle are also typically enclosed during most of the dry season, particularly during the second year of feeding, in order to minimize exertion and weight loss. Manure is also collected in the stall during the dry season. Economic analysis of returns to stall-feeding demonstrates that about half of the net benefits are in the form of additional grain production resulting from manure application (Holtzman, 1987).

Figure 1: Mandara Mountains Region



8. The human population of the Mandara Mountains region, which was 547,748 in 1980, is predominantly rural (> 90%), although there are several small but rapidly growing towns, particularly Mokolo, Mora, Koza and Bourha. The population of Mokolo, a departmental seat, increased from 5,200 to 10,7000 between 1976 and 1980 - an annual growth rate of nearly 20%.

Increasing commercialization of stall-feeding

9. Cattle stall-feeding has a strong basis in traditional social practice. Producers often slaughter finished bulls at the annual post-harvest festival (November-December) or in celebration of the Marai (January-February), the festival of the bull, which is held once every two to three years in villages of the dominant ethnic group, the Mafa. Beef from slaughtered cattle is customarily distributed to the extended family or to friends. This practice helps to cement social and political relations within the village and between neighbouring villages.

10. Before the 1970s few stall-fed cattle were sold, and most finished animals were slaughtered by producers in their villages so that beef could be distributed in accordance with customary social practice. By the early 1980s many farmers had begun to raise cattle for commercial sale, selling their bulls to local cattle traders or rural butchers.[2/] Cattle price inflation in West and central West Africa during the 1970s and early 1980s induced many producers to sell stall-fed cattle on the hoof or at least some beef from slaughtered stock in order to acquire cash for reinvestment in cattle.[3/] Producers also use revenues from cattle and beef sales to pay taxes, buy clothing and other consumer goods, and make discretionary purchases.

Promotion of stall-feeding

11. Expansion of smallholder stall-feeding of cattle has been promoted through a pilot credit scheme funded under a World Bank assisted project. This project extends loans to producers for the purchase of bull calves and supplemental feedstuffs, such as rice bran and cottonseed cake. The project introduced the technology of supplemental feeding to reduce cattle weight losses during the long dry season. Producers in the Mandara Mountains typically store grasses and agricultural by-products, such as peanut leaves, sweet potato and cowpea vines, and sorghum stalks and leaves, for dry season feeding. Before the project, however, they had no experience in feeding concentrates such as rice bran and cottonseed cake.

12. The stall-feeding scheme has been implemented through a Cameroonian parastatal, Fonds National de Development Rural (FONADER). FONADER intended to extend 2,000 loans for two-year feeding by the fifth year (1983) of the project, but it fell short, extending only 1,330 loans. The credit scheme aimed eventually to extend 1,000 loans per year so that 2,000 loans would be outstanding at any one point.

13. The credit program was initially implemented with an incomplete understanding of broader livestock subsector and policy issues. The potentially negative consequences of cattle export restrictions and retail price controls on beef sales were not fully appreciated. Export restrictions increase the risks of cattle trade with Nigeria, as there are potentially high costs of being caught and paying fines. This has the effect of increasing returns to cattle smuggling. Prices for well-fleshed trade cattle are also higher across the border in Nigeria than in northern Cameroon. Nigerian border markets such as Mubi are well attended by cattle traders who assemble well-fleshed cattle for shipment by truck to the heavily populated urban markets of southern Nigeria. Given the strong demand across the border which has diverted supplies to unintended (foreign) markets, Cameroonian traders are able to offer producers premium prices for stall-fed cattle. Retail price controls have also constrained urban slaughter of locally-produced stall-fed cattle whose higher quality beef is more costly than range-fed animals trekked in from an adjacent region, the Diamare Plains. As will be demonstrated in the following sections, urban butchers cannot profitably slaughter stall-fed animals as long as price controls are enforced.

Wholesale butchers' procurement and slaughter practices

(i) Characteristics and seasonality of cattle slaughter at Mokolo

14. Detailed information was obtained from wholesale butchers at weekly markets in Mokolo, Soulede and Ziver about cattle slaughter over a seven month period in 1980-81 (see Table 1). Mokolo is the major urban market and Soulede and Ziver are nearby rural markets. Cattle carcasses were weighed weekly at Mokolo on the busiest market day (Wednesday), and monthly subtotals are shown in Table 2 for the period September 1980-March 1981.

15. Several of the characteristics of cattle slaughter at Mokolo are quite striking. First, 65% of all the cattle slaughtered at Mokolo were females, principally old cows. These cull cows are acquired at the lowest possible price per kilogram, and the quality of their beef is inferior to stall-fed bulls. Second, it is surprising to note that the Mokolo butchers slaughtered only 34 stall-fed cattle (4.3% of 795 head), given the prevalence of stall-feeding by farmers in the villages around Mokolo. Ninety-five percent of all cattle slaughtered at Mokolo were range-fed animals; 83% were acquired in another region, the Diamare Plains, and at such markets as Gazawa, and Meme. Third, cattle attain their maximum carcass weights and hence liveweights from October through December, after having grazed on the fresh, protein-rich grasses during the rainy season and while pasture is still relatively abundant. Beginning in January carcass weights fall off steadily until June, reaching annual lows when pasture is extremely scarce.[4/]

16. A final striking characteristic is that cattle prices per kilogram (carcass weight plus offals) are lowest in October and November and rise progressively during the dry season, beginning in December.[5/] The factors responsible for this trend are that: a) cattle liveweights and carcass weights decline steadily during the dry season; b) slaughter cattle supply contracts in the area around Mokolo and in the cattle markets of the Diamare Plains as the dry season progresses; and c) demand for beef remains relatively strong during the most of the dry season in rural areas.[6/] Rural butchers also compete with town butchers for the limited supply of locally available slaughter cattle, bidding up prices in the process.

Table 1: Selected characteristics of cattle slaughtered at one urban and two rural markets in the MANDARA MOUNTAINS, September, 1980-March 1981

Market	No. of Cattle Slaughtered	No. of Males	No. of Females	No. of Stall-Fed Cattle	No. of Oxen	No. of Range-Fed Cattle	No. of Cattle Bought in Diamare Plains Markets	No. of Cattle[a] Acquired Locally	Average Age of Cattle Slaughtered (Years)	Acquisition Price (FCFA)		Weight of Four Quarters (Kg.)		Economically Useable Carcass Weight[b] (Kg.)		Price Paid Per Kg. Carcass Weight[c] (FCFA)	
										Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Soulede	37	27	10	11	2	24	2	35	4.2	42,715	18.519	107.8	36.2	133.6	45.4	317	53
Ziver	39	31	8	21	2	15	12	27	5.1	49.577	18.336						
Mokolo[d]	220	71	141	9	0	211	182	38	5.3	40.443	10.959	95.6	27.2	126.6	32.9	323	53
Mokolo[e]	575	196	379	25	3	544	482	93	5.1	41.505	10.211						
Total[f]	871	325	538	66	7	795	577	194	5.8	41.654	11.453						
Total[g]	257	98	151	20	2	235	183	74	5.2	40.774	12.238	98.0	28.7	127.5	34.6	322	53

Source: Survey of butchering and retailing.

a Local acquisition is defined as purchase within a 20 kilometer radius of the market.

b The economically useable carcass weight is the four quarters plus edible offals.

c This is not a weighted mean. Each observation is equally weighted.

d This category includes only cattle slaughtered on market day (Wednesday) in Mokolo.

e This category includes cattle slaughtered on days other than market day in Mokolo.

f These figures are totals for the entire sample.

g These figures are a subtotal of the entire sample. Carcass weights and therefore the price paid par kg. were obtained only for cattle slaughtered at Soulede and at Mokolo on market day consisting of 257 (37 + 220) head.

Table 2: Cattle slaughter at Mokolo on the day of the large market, September 1980-March 1981

	Number of Carcasses Weighed	No. of Males	No. of Females	No. of Stall-Fed Cattle	No. of Range-Fed Cattle	No. of Cattle Bought in Markets of	Number of Cattle Bought Around Mokolo	(1) Mean Carcass Weight (kg.)	Standard Deviation	(2) Mean Weight of Carcass Plus	Standard Deviation	(3) Mean Acquisition Price (FCFA)	Standard Deviation	(4) Mean Price Paid Per kg. of	Standard Deviation

						Diamare Plains				Fifth Quarter (kg.)				Beef (3)/(2)	
September	24	13	11	0	24	16	8	95.9	27.1	124.9	33.4	39.155	13.222	314	64
October	33	12	13	3	30	25	7	114.7	38.3	147.5	45.1	43.895	14.070	304	39
November	35	12	23	5	30	24	11	109.0	33.3	142.1	38.7	42.776	15.026	299	41
December	48	14	34	1	47	40	8	95.6	23.3	126.5	28.9	39.552	9.203	317	55
January	37	7	30	0	37	36	1	87.9	16.5	116.5	20.9	39.257	7.359	338	49
February	20	7	13	0	20	18	2	88.0	22.2	115.7	28.2	38.475	8.359	337	47
March	23	6	17	0	23	22	1	83.0	14.0	109.9	18.2	39.108	6.643	357	30
Total	220	71	141	9	211	182	38	96.6	27.2	125.6	32.9	40.443	10.959	323	53

Source: Survey of butchering and retailing.

(ii) Sources of urban slaughter cattle supply

17. The butchers at Mokolo, Mora and Koza, the three principal towns of the Mandara Mountains region, depend heavily on the cattle markets of the Diamare Plains for their supply of slaughter cattle. These urban butchers procured about 75%, or 2,485 of the 3,313 cattle they slaughtered in 1980, in the markets of the Diamare Plains. It is also estimated that approximately 1,100 head of the 2,000 cattle slaughtered in regional towns other than Mokolo, Mora and Koza were procured in the Diamare Plains. Summing across the two subgroups, approximately 5,300 head of cattle were slaughtered by urban butchers in the towns of the Mandara Mountains region in 1980, of which 3,580 head or about two-thirds were acquired in the markets of the Diamare Plains (see Table 3). The remaining third was obtained from the Mandara Mountains regional extensive herd and from producers of stall-fed cattle. Nearly 1,500 head were taken off the regional extensive herd for slaughter by urban butchers, but only 230 or 4.3% of the 5,300 head slaughtered in towns were stall-fed animals. In contrast to urban butchers, rural butchers procure far larger numbers of stall-fed cattle for slaughter (1,595 of which 590 on the hoof and 1,005 "on the rail"). Cattle and beef flows into, within and out of the Mandara Mountains region are depicted in Figure 2.

Retail beef prices

(i) Administered prices

18. In the larger towns of the Mandara Mountains region, such as Mokolo, Mora and Koza, two grades of beef are weighed and sold by the kilogram: beef with bones and beef without bones. The control prices in 1980-81, when the average exchange rate was 240 FCFA = US$ 1.00, were 300 FCFA for the former and 350 FCFA for the latter. The filet, tongue, head, hooves, and skin are not sold by the kilogram but rather in their entirety. The offals are cut up and sold in small unweighed piles at higher prices per kilogram than beef with bones.

19. The determination of retail beef price ceilings is left to the jurisdiction of prefectoral administrations in northern Cameroon, who set prices independently of one another and disregard regional supply and demand factors in the process. As shown in Table 4, retail price controls are set at a higher level in the towns of Maroua, Garoua and Yagoua than in the principal towns of the Mandara Mountains. Price controls are also less vigorously enforced in the towns outside the Mandara Mountains. Yet cattle prices, which are unregulated in the markets of northern Cameroon, are lower in the markets of the eastern half of northern Cameroon (Maroua and Yagoua) than the markets of the western half (Mandara Mountains).

Figure 2: Market channels for cattle and beef in The Mandara Mountains Region 1980

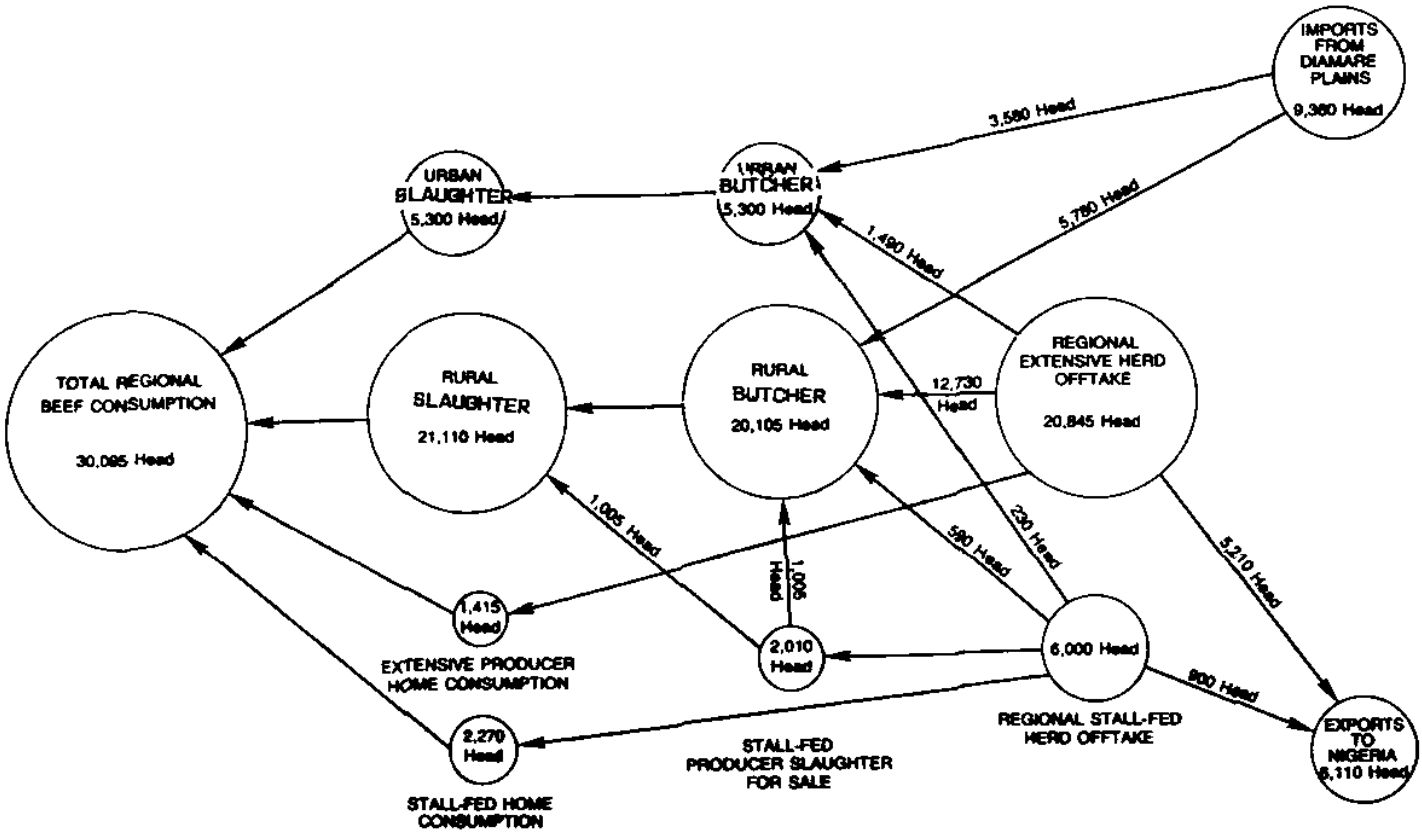


Table 3: Butchers' sources of beef and slaughter cattle, 1980

	Urban Butchers		Rural Butchers	
	No. of Head	% Total	No. of Head	% Total
Offtake from regional extensive herd	1,490	28	12,730	63
Stall-fed cattle on the hoof	230	4	590	3
Beef from stall-fed cattle slaughtered by owners (in stall-fed cattle equivalents)	0	0	1,005	5
Imports of live cattle from the Plains	3,580	68	5,780	29

Total	5,300	100	20,105	100

Source: Livestock Service statistics, survey data, author estimates.

Table 4: Retail beef control prices in effect at important towns in northern Cameroon, March 1981 (FCFA/kg.)

	Mokolo, Koza, Mora	Maroua	Yagoua	Garoua
Beef with bones	300	400	350	500
Beef without bones	350	450	400	600

Source: Prefectoral authorities and Livestock Service officials in northern Cameroon

20. Butchers in Mokolo, Koza and Mora, the major towns of the Mandara Mountains, generally pay as high or higher wholesale (i.e., liveweight) prices per kilogram than Maroua and Yagoua butchers, but are forced to retail beef at lower control prices. This discriminatory price policy has evoked numerous protests from Mokolo butchers, who are forced to bid for slaughter cattle in the Diamare Plains with butchers from Maroua and Gazawa.

(ii) Seasonal variation in retail beef prices

21. Purchased beef was weighed weekly from September 1980 through March 1981 at three periodic markets in the Mandara Mountains (Mokolo, Tourou and Soulede) and at one market in the Diamare Plains (Gazawa). The average monthly prices for beef with bones and beef without bones are plotted in Figures 3 and 4. The low beef prices in Mokolo compared to prices in the other markets is striking. Retail price controls of 300 FCFA for beef with bones and 350 FCFA for beef without bones were enforced, and the data show that the Mokolo butchers respected the controls when weighing beef for sale. As a result of the price controls, there was little seasonal variation in retail beef prices at Mokolo. Prices trended upward very gently from September 1980 to March 1981.

22. While beef prices at Mokolo (and the larger towns of Koza and Mora) were maintained artificially low by price controls, retail prices for beef with and without bones at Soulede, Tourou and Gazawa, which were not controlled, were roughly double those at Mokolo when averaged over the six-to-seven month period. Prices continue to trend upward from March through June at these markets, as slaughter cattle supplies remain constricted and farmers and herders are reluctant to sell cattle in poor condition. Once the rains become regular and the condition of livestock improves by July, more and better conditioned cattle are offered for sale by herders, who need to buy grain and pay for seasonal agricultural laborers (see footnotes 4 and 5 for the basis of these statements).

Urban butchers' costs and returns under existing procurement strategies

23. Enterprise budgets are a useful tool for gauging the profitability of agricultural and livestock marketing activities. Cost and net return data are sensitive and need to be obtained in a skilful way. This study used periodic, structured informal interviews with Mokolo butchers to elicit information on costs of procuring cattle for slaughter and of providing marketing services. Gross returns were calculated from beef quantity (carcass weight) and retail price data obtained by weighing carcasses at slaughterhouses and beef purchased by consumers. Table 5 presents enterprise budgets that show representative costs and returns for butchering and retailing of range-fed and stall-fed cattle at Mokolo from September 1980 through March 1981.

Figure 3: Retail prices of beef with bones at four markets in the Mandara Mountains

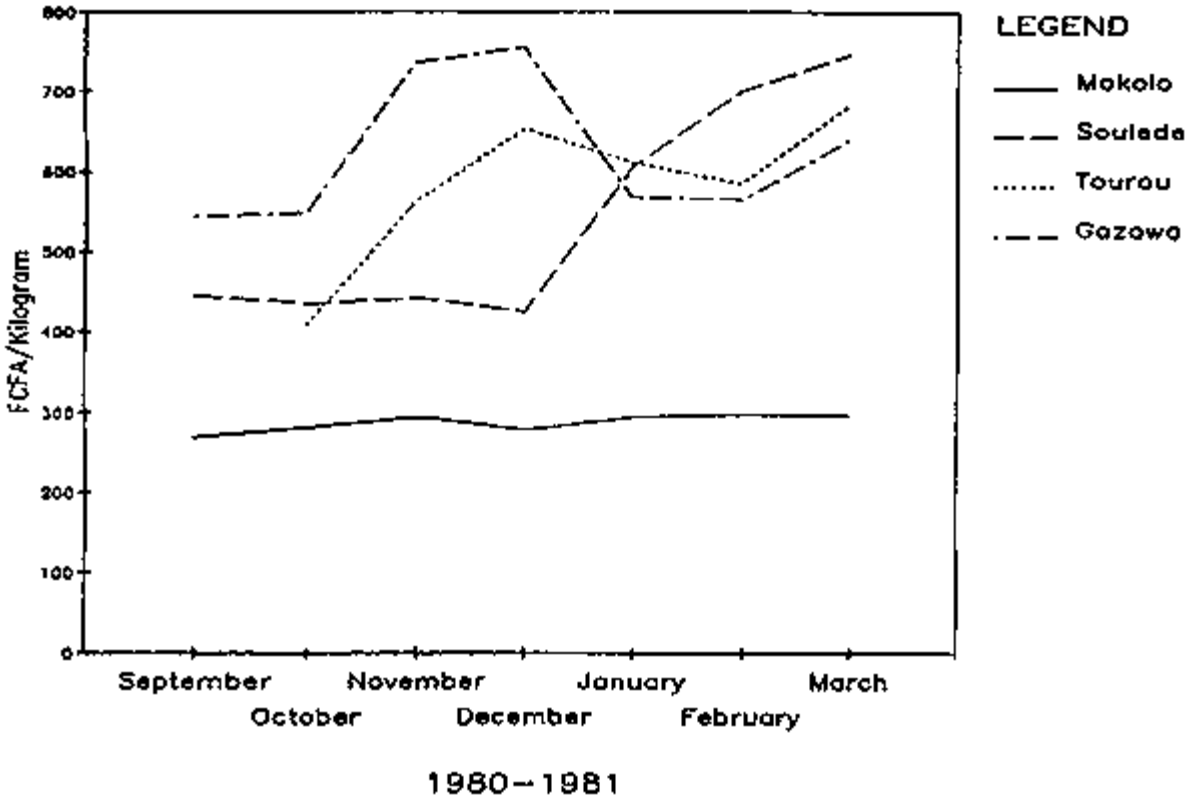
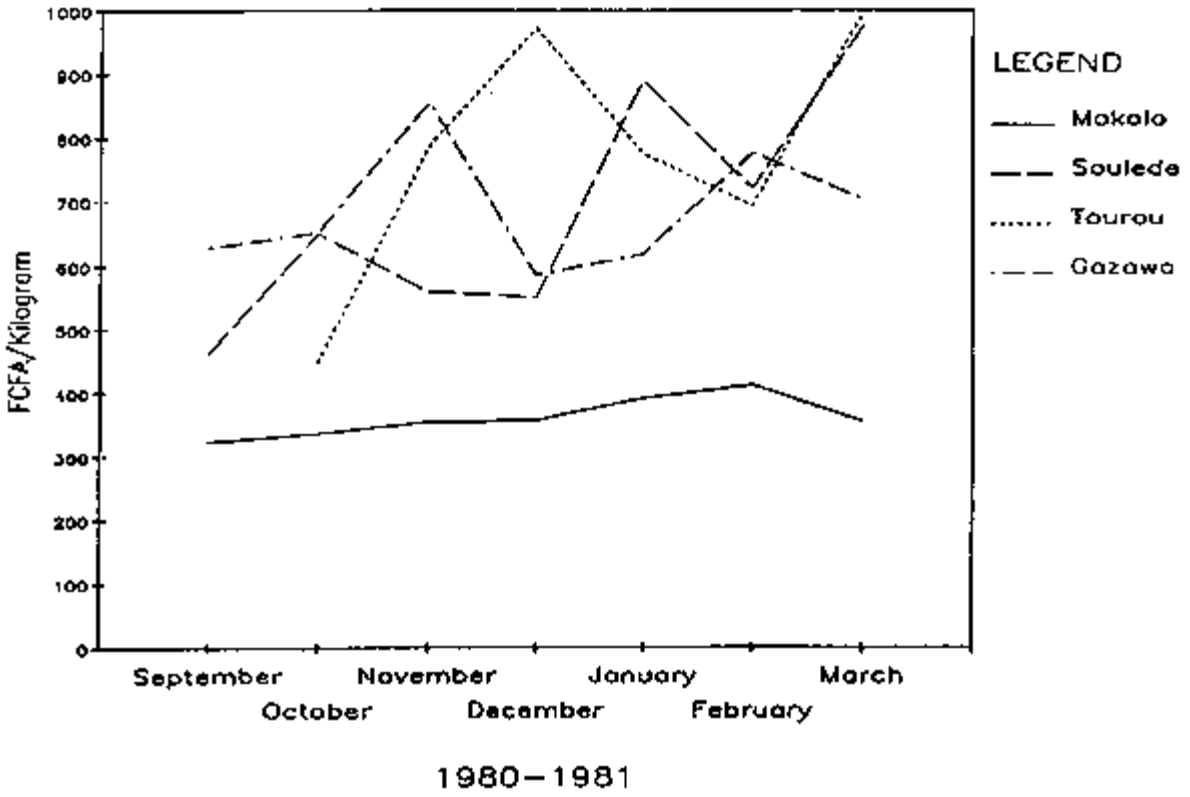


Figure 4: Retail prices of beef without bones at four markets in the Mandara mountains



(i) Returns to slaughtering grange-fed cattle

24. Gross returns to butchers' labor and management and to the labor of the apprentices depend upon the cattle carcass weight times retail prices per kilogram for each type of beef, as well as the prices butchers are able to obtain for the parts of the carcass not sold at a fixed price per kilogram. Cattle acquisition prices and slaughter and retailing costs are then deducted to arrive at net returns. As shown in Table 5, the average net return for butchering and retailing of range-fed cattle which were acquired at an average price of 39,513 FCFA is approximately 1,600 FCFA per head. This return is divided between the wholesale butcher and his apprentices. The average return to the wholesale butchers' labor and management is 1,000 FCFA per head, which is only 2.5% of the average acquisition price paid for range-fed cattle.[7/]

25. Mokolo survey data and Livestock Service slaughter statistics show that the seven principal wholesale butchers at Mokolo slaughter an average of 237 head per year, of which 231 head are range-fed cattle. If the average net return to wholesale butchers' labor and management is 1,000 FCFA per head of range-fed cattle, their annual income from slaughtering range-fed cattle is 231,000 FCFA ($960).

(ii) Returns to slaughtering stall-fed cattle

26. Only nine of the 220 cattle slaughtered at Mokolo on market day from September 1980 through March 1981 were stall-fed bulls; estimates of costs and returns are based on a small sample of 8 head. Stall-fed cattle are only slaughtered at Mokolo from October through December when the supply of stall-fed cattle is plentiful and butchers are able to procure cattle at relatively low prices per kilogram. The Mokolo butchers paid 326 FCFA per kilogram (for the four quarters plus offals) for 8 stall-fed bulls, while they paid 320 FCFA per kilogram for the 211 range-fed cattle.

27. Net returns to the labor, management and capital of the wholesale butcher and to the labor of the apprentices average 3500 FCFA per stall-fed bull, of which 2500 FCFA is a return to the

wholesale butcher's labor and management. Each of the seven principal wholesale butchers at Mokolo slaughters an average of no more than six head of stall-fed cattle per year. Given an average net return of 2500 FCFA per head of stall-fed cattle, the wholesale butchers earn 15,000 FCFA from slaughtering the stall-fed bulls.

Table 5: Representative costs and returns of slaughtering range-fed cattle and stall-fed cattle (in FCFA)

Cost and Return Categories	Range-Fed Cattle	Stall-Fed Cattle
Costs		
1. Purchase of animal	39,513	65,250
2. Market tax plus cattle movement permit	200	0
3. Transport of butcher to and from place of purchase	700	200-500
4. Transport of animal from place of purchase of Mokolo	150-300	500-1,000
5. Trucking of weak or injured cattle to Mokolo	127	0
6. Payment to herder for herding animal near Mokolo	200-400	200-400
7. Slaughter tax	100	100
8. Retail marketing tax	400	400
9. Payment to mallam to cut throat	100	100
10. Payment to apprentices for dressing out animal	500-1,000	500-1,000
11. Transport of meat from slaughter slab to market	300	300
12. Amortization of butcher's license	99	99
13. Loss through condemnation, death en route (Gazawa-Mokolo), flight of animal	834	0
14. Opportunity cost of capital	63	63
Total cost - value range	42,714-43,564	67,712-69,212
- average value	43,139	68,462
Receipts		
1. Beef sold bone-in at 300 FCFA/kg.	24,000	37,500
2. Beef sold bone-out at 350 FCFA/kg.	3,350	10,500
3. Filet sold at 525 FCFA/kg.	1,470	3,045
4. Liver (3-5 kg.)	1,200-2, 000	2, 000
5. Head	700-2,000	2,000
6. Hide	500-700	700
7. Tail (1-3 kg.)	250-400	400
8. Hooves	600-1,000	1,000
9. Hump	500-1,200	2,000
10. Tongue	500-1,000	1,000
11. Other offals; intestines, spleen, heart, kidneys, lungs (sold at 350 FCFA/kg.)	8,160	11,730
Total receipts - value range	42,730-46,780	71,875
- average value	44,755	
Net Return to Butcher's Labour and Management - value range	-834 to 4,066	2,663 to 4,163
- average value	1,616	3,413
Net return/total receipts	-1.9% to 8.7%	3.7% to 5.8%

28. The average rate of return to slaughtering stall-fed bulls is higher than that to slaughtering range-fed cattle, reflecting the experience and good judgement of the Mokolo butchers, who respond to the opportunity to procure these cattle at low prices per kilogram liveweight during the immediate post-harvest period (October-December) of abundant supply. The Mokolo butchers report that these opportunities arise infrequently during other periods of the year; no slaughter of stall-fed cattle was observed after the month of December. Cattle traders and rural butchers, whose offer prices are not constrained by retail price controls, are able to offer higher prices than urban butchers, who must sell most of the carcass at 300-350 FCFA per kilogram. Therefore, it is important to note that Table 5 illustrates the maximum return urban butchers are able to earn when opportunities arise to procure stall-fed cattle at low cost. At average acquisition prices of 350 FCFA per kilogram paid by rural butchers at Soulede, returns to urban slaughter of stall-fed cattle are negative.

(iii) Annual return to labor and management

29. By combining returns to slaughtering stall-fed cattle and range-fed cattle, the annual net return to labor and management in slaughtering the 237 range-fed and stall-fed cattle is 246,000 FCFA or $1,025 (US$ 1.00 = 240 FCFA). Wholesale butchers earn a net return to labor and management of 984 FCFA per day.[8/] This return is higher than the average peak agricultural season wage rate of 300-500 FCFA per man-day, but it is somewhat less than the salary of a primary school teacher, who earned 30,000 FCFA per month in 1980-81, or a daily wage rate of 1200 FCFA. The butcher's return is significantly lower than the remuneration of a secondary school teacher or civil servant.

30. Although some policy-makers are quick to charge that urban butchers and other marketing agents earn excessive profits, our empirical findings show that they earn an acceptable but rather low return for slaughtering cattle. In order to compete successfully in urban butchering and retailing enterprises, butchers must be skilful in judging the returns a live animal will bring once it is slaughtered. They must also provide capital and absorb the risks of mortality or forced slaughter and sale when trekking range-fed cattle from distant markets such as Gazawa to Mokolo.[9/] These risks are quite high during periods of nutritional stress and inadequate water supply, particularly during the hot dry season (February-April).

Potential effects of maintaining and relaxing price controls on urban slaughter of stall-fed cattle

31. The short and long-run effects of both maintaining and relaxing retail price controls on urban slaughter of stall-fed cattle have important implications for the expansion of stall-fed production in the Mandara Mountains. In the short-run, removing, or at least increasing the level of controlled retail prices in urban areas would allow urban butchers to compete with rural butchers and cattle traders for the higher quality locally raised animals. This should result in higher prices for stall-fed cattle, thereby benefitting producers. Many urban consumers are willing to pay higher prices for beef. This is demonstrated by the considerable numbers who attend secondary markets near urban areas in order to buy higher quality beef which is retailed at prices well above the maximum retail price enforced in urban areas. Consumers in Mokolo complain about shortages of beef, particularly during the late dry season and early rainy season. This is precisely the period when high cattle acquisition prices per kilogram and the relatively low retail ceiling prices on the sale of beef induce urban butchers to slaughter fewer cattle. Thus, the overall result of controlling prices at artificially low levels is that production is restricted while demand remains unsatisfied.

32. By removing price controls and allowing urban butchers to bid competitively for stall animals, more of the estimated 6,000 cattle taken off the regional stall-fed herd each year would likely be sold for urban slaughter. If 10% of the 1980 urban beef supply had come from stall-fed cattle, for example, 487 more stall animals would have been slaughtered (adding to the 230 head actually slaughtered). The potential short-run effect of relaxing price controls on urban butchers' procurement practices would likely stimulate commercial production of stall animals in the Mandara Mountains.

33. In the medium to long-run, removing retail price controls would provide opportunities for stall-fed cattle producers and butchers to satisfy the expanding demand for beef in urban areas in the Mandara Mountains. Demand for beef can be projected for 1990 by using 1980 estimates of urban and rural beef consumption, and by assuming likely ranges for key variables such as income elasticity of demand for beef and rates of population and per capita income growth for urban and rural areas. Increase in beef consumption can be projected using the following simple formulation: d = pop + (n * y), where d = the percentage change in consumption of beef between 1980 and 1990, and pop = the percentage change in population between 1980 and 1990, and n = the income elasticity of demand for beef, and y = the percentage change in real per capita income between 1980 and 1990. Relative prices are assumed to remain constant over the 1980-1990 period.[10/]

34. For the purposes of this analysis, urban areas include 10 percent of the population of the Mandara Mountains region, and rural areas include the remaining 90%. It is assumed that the urban population will grow at an average annual rate of 5% during the 1980s and the rural population at the rate of 2%. The income elasticity of demand is assumed to fall in the 0.6-1.0 range for urban areas and 0.2-0.5 for rural areas.[11/] Real per capita income growth is first assumed to be 2% and then 5% per year for both urban and rural areas.

35. Projected incremental beef consumption in urban areas, expressed in metric tons and stall-fed cattle equivalents in Table 6, is an additional 510-844 metric tons of beef by 1990. if this additional demand were met entirely by slaughtering locally produced stall-fed cattle, then 2,523-4,174 additional bulls would need to be slaughtered by 1990. The demand estimates

also show that an additional 917-1,861 metric tons of beef will be consumed in rural areas of the Mandara Mountains region by 1990. If incremental rural demand were satisfied solely by slaughter of stall-fed cattle, an additional 4,534-9,204 animals would have to be slaughtered by 1990. This is unlikely to occur, since approximately half of the regional rural population resides outside of stall-feeding production zones, which are found in the mountains and the piedmont, and slaughter of stall-fed cattle is uncommon in these plateau and plains areas.[12/]

Table 6: Projected beef consumption in The Mandara Mountains Region, 1990

	Income[a] Elasticity of Demand	Rate of Income Growth	Incremental Beef Consumption[b] (metric tons of beef and offals)	Incremental Cattle Slaughter[c] (stall-fed cattle equivalents)
			1990	1990
Urban[d]	0.6	2%	510	2523
		5%	675	3339
	1.0	2%	568	2814
		5%	844	4174
Rural[d]	0.2	2%	917	4534
		5%	1203	5948
	0.5	2%	1146	5567
		5%	1861	9204

[a] Lower and upper bounds on the income elasticity of demand for beef are used in projecting demand. Higher estimates for the urban areas reflect greater purchasing power and hence the ability to make discretionary purchases. The lower estimates for rural areas are based upon expenditure data obtained from a sample of 52 households in two villages near Mokolo.

[b] Incremental beef consumption is calculated using 1980 estimates of beef consumption in rural and urban areas as a base.

[c] The incremental beef consumption is converted to stall-fed cattle equivalents by using the average weight of the four quarters plus offals (202.2 kg.) for stall-fed cattle slaughtered at Mokolo.

[d] The urban population comprises 10% of the regional population, and urban areas absorbed 5300 head of cattle in the base year of 1980. Estimated urban beef consumption was 671 metric tons in 1980. The rural population is the remaining 90% of the regional population, which absorbed an estimated 3488 metric tons of beef in 1980.

36. While demand for stall-fed beef in the Mandara Mountains region will expand under reasonable sets of assumptions, pricing policies will play an important role in assuring that increased demand is satisfied. If only 4.3% of incremental demand for beef in urban areas in 1990 were satisfied by slaughtering stall-fed cattle, only 142-235 additional stall animals would be slaughtered. This scenario assumes that the 1980 market share for stall-fed animals is maintained in urban areas in the future, due to continued enforcement of retail price ceilings which are set below market-clearing levels. If retail control prices were relaxed or removed, it is likely that far more stall-fed cattle would be acquired by wholesale butchers for urban slaughter. Another scenario is that the cattle-surplus Diamare Plains would supply 70% of urban butchers' incremental needs in the Mandara Mountains reflecting the same Plains' proportion of 1980 slaughter. It is further assumed that the remaining 30% of incremental slaughter is divided equally between locally produced stall-fed and range-fed animals. Under

this set of assumptions, 471-781 additional head of stall-fed cattle would be slaughtered in 1990 than in 1980. The urban market for beef in the Mandara Mountains could, therefore, absorb about half to three-quarters of the annual stall-fed cattle output (1,000 head) of a credit program that extended 1,000 stall-feeding loans per year by 1990.[13/]

Policy conclusions

37. Presently, urban butchers in the Mandara Mountains procure about two-thirds of their slaughter cattle from another region, the Diamare Plains. These animals are inferior in quality to locally available stall-fed bulls. The premium that consumers are willing to pay in rural markets for stall-fed beef is evidence of a preference within the region for the high-quality local beef. The slaughter of so many old cows in urban areas, whose beef is tough and less preferred than the beef of stall-fed cattle, is in large part the result of restrictive pricing policies.

38. Artificially low retail beef prices provide urban butchers with incentives to procure low grade cattle for slaughter at low prices per unit liveweight. The retail price and slaughter data and estimates of butchers' costs at Mokolo show that urban butchers are unable to earn acceptable returns from slaughtering stall-fed cattle, except during the immediate post-harvest period when slaughter cattle are relatively abundant. They cannot afford to pay producers attractive prices for stall-fed cattle in competition with rural butchers and cattle traders. Although policy-makers are quick to allege that marketing agents earn excessively high profits, the empirical research results show that urban beef prices and annual returns to urban butchers are relatively low. Returns are comparable to an extension agent's salary and slightly lower than the annual earnings of primary school teachers in Cameroon. In light of the skills required and risks undertaken, urban butchers' returns do not appear unduly high.

39. Retail price controls have the perverse effect, therefore, of limiting urban slaughter of higher quality stall-fed cattle in the Mandara Mountains region. Urban markets are not allowed to be viable marketing alternatives for producers of stall-fed cattle as long as restrictive pricing policies are in force. This is reflected in survey results showing that few stall-fed cattle were slaughtered in urban relative to rural markets. Yet the urban areas, which are characterized by higher per capita incomes and population growth rates than rural areas, are potentially attractive outlets for large numbers of stall-fed cattle. Demand projections clearly show the potential of urban areas for absorbing greater numbers of stall animals through 1990 (Holtzman, 1982). If retail price controls were relaxed, stall-fed cattle could not only satisfy much of the incremental expansion in urban demand for beef in the late 1980s and 1990s but would probably substitute at least in part for existing sources of local urban supply. Paving of the Mokolo-Maroua road in 1983 reduced transport costs and time for the 78 kilometer trip, making feasible slaughter of stall-fed cattle in Mokolo, transport of fresh beef to Maroua, and sales of high quality beef in a much larger urban agglomeration (population of about 80,000 in 1980). The far greater purchasing power of Maroua relative to towns in the Mandara Mountains region is partly reflected in retail beef prices being 33-50% higher.

40. The adverse effects of retail price controls on the urban beef supply in the Mandara Mountains have important implications for the promising World Bank funded stall-feeding credit scheme as well as lessons for other fattening schemes like it. The economic viability of this project could be undermined by failing to raise or remove retail price ceilings. Retaining price controls will limit regional absorptive capacity, necessitating increased rural slaughter and export of surplus stall animals to Nigeria. Given the decline in oil revenues, devaluation of the naira, and persistent balance of payments difficulties, Nigeria's potential for absorbing more stall-fed cattle will be limited in the medium-term. As a result, getting prices right within the Mandara Mountains region will play a very important role in determining the success of expanded stall-feeding and the tapping of alternative (urban) markets.

Footnotes

1. This estimate is based upon survey findings of average household size and the proportion of households that stall-feed cattle; human population estimates, and Livestock Service estimates of the cattle population in the Mandara Mountains region.

2. Traders trek cattle across the border to Nigerian markets, where butchers and long distance traders pay a premium for well-fleshed animals. Twenty-eight percent of a sample of 272 stall-fed cattle were sold on the hoof by producers during 1977-1981. The other 72% were slaughtered by producers who reserved some or all of the beef for traditional distribution and household consumption. In 26% of the sample cases, no beef was sold. Producers sold at least one quarter of the carcass from slaughtered bulls to other villagers, including local butchers, or to buyers from neighboring villages in 46% of the cases. In 35% of the sample, producers sold three quarters or more beef from the carcass.

3. This inflation was fueled in part by the rapid growth of the Nigerian economy following the petroleum price hikes of the 1970s which were accompanied by accelerating urbanization and increased incomes. Retail price data for beef from Yaounde, the capital of Cameroon, show average annual appreciation of 496 in real terms between 1970 and 1981.

4. Although slaughter data were not collected by the author in Mokolo after March 1981, data collected by the lycee in Mokolo for the 1976-1981 period show lowest carcass weights in June.

5. Although cattle prices are lowest per kilogram in the October-December period, live animal prices are highest at this time. Cattle are in good condition after the six-month rainy season, and their higher liveweights offset low prices per kilogram, resulting in seasonally high live animal prices.

6. Farm families dispose of income from sales of crops such as sweet potatoes and peanuts as well as cash remittances earned in off-farm dry season employment in urban areas outside the Mandara Mountains (in northern Cameroon and northeastern Nigeria).

7. The butchers' apprentices buy parts of the carcass from the wholesale butcher on one-day credit and retail the beef. Two apprentices working with one butcher each earned 300 FCFA per animal.

8. Butchers report working five days a week for fifty weeks of the year.

9. Butchers generally procure at least two range-fed cattle for slaughter at the market of Gazawa per trip to spread costs. Purchases on credit are rare. Hence, they require at least 60,000-70,000 FCFA as working capital.

10. Despite what is discussed subsequently, it is relevant to point out that a relaxation or outright removal of price controls will have an effect on the projected figures and that it is likely beef consumption will be somewhat lower than projected. Theoretically, the lower projections could also partly result from lower priced meats which could substitute for beef although relative prices remain constant or stable (Editor's note).

11. Arc expenditure elasticities of demand estimated for a sample of 52 rural households were 0.51 between middle and high income households and 0.15 between low and middle income

households.

12. It is important to note that incremental demand for beef in rural areas will be 2-2.2 times the incremental demand for beef in urban areas by 1990, even though the projected ranges of population growth and income elasticity of demand are lower for rural areas than for urban areas. The reason for this is that the regional rural population is nine times larger than the urban population.

13. A third scenario for urban areas, representing a very optimistic possibility, would be for urban butchers to meet 50% of the incremental demand for slaughter stock by procuring stall-fed animals. This scenario could only be realized if retail price ceilings were above free market price levels or removed entirely. Under this scenario urban butchers could slaughter an additional 1,573-2,602 stall-fed animals by 1990. By removing price controls, urban markets could offer as much potential for expanded slaughter of stall-fed cattle as rural areas by 1985 and 1990. It is also important to note that increasing rural demand for beef will also increase demand for stall-fed cattle by 1990.

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