

The Marketing of Malian Cattle

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Two studies have appeared recently which examine carefully the conventional proposition that food marketing systems in less developed countries function badly and are an important hindrance to development (5,7). The conclusion of these studies, in the case of Africa and India of least, is that these systems are, instead, surprisingly efficient and responsive to changing conditions of demand and supply, approaching fairly well the ideal of perfect competition. Although some areas are identified in which government might intervene effectively to improve marketing, these are not found to be numerous, and the harm done by excessive state intervention is frequently the greater danger (7).

One important distribution system which has not yet received much attention is that of cattle marketing in West Africa. This system is especially interesting because it includes trade across national boundaries, as animals are moved from the major supplying countries in the interior to the chief centers of consumption along the coast. It is also of interest because the combination of a relatively high income elasticity of demand for meat and rapidly rising incomes in some of the coastal countries, such as Nigeria and the Ivory Coast, is causing consumption to increase very rapidly, yet the major producers are nomadic pastoralists relatively untouched by modernization. The commercial network linking demand and supply has, moreover, been developed spontaneously by traditional African traders with virtually

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no intervention from government. The question is increasingly being asked, therefore, whether this system is adequate or whether the state should in the future play a greater role in cattle marketing. The answer to a large extent depends on the degree of efficiency of the present system.

The most extensive studies of cattle marketing in West Africa have been made in several countries by the Société d' Etudes pour le Développement Economique et Social (SEDES), a French research firm with many years of experience in the region (9, 10). In addition to describing the system, these studies supply an abundance of data on production, consumption, movements, costs, and prices. Aside from this source, supplementary information for this paper was acquired in the field by the author when he visited Mali as a member of a USAID mission in early 1973.

The choice of Mali as a case study of cattle marketing in West Africa is warranted for reasons other than the availability of data. For one thing, it is the largest West African producer, with a total herd size estimated at 5.35 million head in 1970.¹ For another, its historic role as gateway to the Sahara has left it with an important merchant class accustomed to long distance trade. Still, conditions of cattle trade in Mali do not appear to be very different from conditions elsewhere in West Africa, in part because of the widespread importance throughout the area of Malian traders, so that the country seems reasonably representative of the region as a whole. In addition,

¹A more complete discussion of Malian cattle production is given in Stryker (11).

our concern is less with the marketing of cattle physically within Mali than with the system which moves them to the consumption centers along the southern coast of West Africa.

This marketing system is described in the next section. It is then evaluated with respect to its relative efficiency by exploring a number of ways in which it might deviate from a situation of perfect competition. In the final section, some conclusions are drawn, and a few policy implications are suggested. The discussion and data refer almost entirely to the period before the 1972-74 drought. This has unquestionably had an effect on marketing conditions, but in ways which may be relatively transitory.

THE CATTLE MARKETING SYSTEM

Of the 1,240,000 square kilometers which comprise Mali, only the Southern quarter is in the Soudanian and Guinean zones where rainfall is adequate for agriculture. The Sahelian zone to the north, making up another quarter of the total land area, is the major livestock region, primarily because it is free of the tsetse fly. Rainfall varies in total and distribution, with about 1,300 millimeters falling in the south from June until October, and both the amount and duration tapering off to less than 100 millimeters in the north. Of major importance, too, is the Niger River, which regularly overflows its banks, forming the vast Interior Delta extending approximately from Ségou in the southwest to Timbuktu in the northeast. Here, cattle are gathered in large numbers toward the end of the dry season to take advantage of the green pasture left behind the receding water.

Cattle are traditionally raised in Mali by nomadic tribes, who live primarily off their milk and who migrate with their herds, according to the availability of rainfall and pasture. In the past, although some milk might occasionally have been traded with farmers for agricultural products, there was virtually no market for cattle, whose meat was consumed only when animals became useless or for ceremonial occasions. With the establishment of the French colonial administration at the end of the nineteenth century, however, the demand for meat increased as urban areas grew in size. In addition, the assessment of a head tax and a cattle tax, payable only in cash, usually necessitated a few cattle being sold by a herder each year. The result was the beginning of a specialized commercial sector dealing in cattle. Its development received added stimulus from the growth of cash crop exports in the coastal territories, especially Ghana and the Ivory Coast, which increased their demand for meat from the interior. Estimates, which are only available for the post-World War II period, indicate that exports of cattle from Mali rose between 1954 and 1970 at an annual rate of almost 6 percent. Even more impressive was the growth of market presentations, an indication of the extent of commercialization, which averaged close to 8 percent during the same period. (12, p. 449).² Furthermore, the commercial system which developed

²This growth was especially remarkable considering the restrictions on private trade in cattle imposed by the Malian government during the 1960's.

to supply urban and coastal markets with beef did so with little or no intervention by modern government. Yet it was highly complex and capable of gathering cattle in small lots over a wide area and moving them hundreds of kilometers to the centers of consumption.

The principal commercial circuits are aligned in a north-south direction since the major producing areas in West Africa are in the north and the major consuming areas are along the coast in the south.³ Aside from very small markets where less than 5000 head per year are exchanged, primarily between herders or between herders and local butchers, the first markets of any importance in the chain are the marchés de collect handling 5000 to 20,000 head a year.⁴ Most of these are located in the pastoral zone and are controlled by the government. Exchange may be between any combination of herders and traders. Local butchers are also present. The most important markets, however, are the marchés de regroupement, which handle almost solely animals to be slaughtered, most of which are exported. In the largest of these, Kati, over 100,000 head are traded each year.⁵

³Except where otherwise indicated this description of the commercial system is taken from SEDES (10).

⁴Among the more important of these markets are Niore, Kayes, Nara, Didieni, Léré, Nampala, Sokolo, Tenenkou, Gathi-Loumo, Toguere-Koumbe, Bambara Maundé, Korientzé, Douentza, Dialassagou, Madiakoye, Gao, and Menaka.

⁵About 300,000 additional head are sold annually in other large markets such as those at Niono, Ansongo, N'Gouma, Kona and Fatoma.

These markets are usually held weekly so that traders can frequent different ones on successive days. Exchange is generally between traders, with intermediary brokers also playing a role.

Recent surveys conducted in a number of these markets indicate that about 70 percent of the animals presented are males. The age composition of marketed cattle is shown in Table 1, where it is compared with that of estimated total herd off-take.

TABLE 1

Age and Sex Composition of Cattle Presented in the Major Malian Markets Compared with Herd Off-take*
(%)

	<u>Presented in Markets</u>	<u>Herd Off-take</u>
<u>Males</u>		
Less Than 3 years	76.4	77
Over 3 years	23.6	23
Total	100.0	100
<u>Females</u>		
Less than 3 years	43	--
3 to 10 years	35	13
Over 10 years	22	87
Total	100	100

*From SEDES, Approvisionnement en Viandes de l'Afrique de l'Ouest (Paris 1973), Part I, p. 308.

This comparison indicates that most males are sold for export or for domestic slaughter, whereas most young and adult females are exchanged between herders, and many old cows are consumed by the herders without entering the market.

As shown in Table 2, there is substantial seasonal variation of activity in these markets. In general, activity is greatest after the end of the rainy season, during which the herds are taken on the transhumance to pastures frequently far from the

TABLE 2

Monthly Sales, Selected Markets, 1971 and 1972*
(head)

	Niono	Douentza	Mopti ^a
<u>Sold-1971</u>			
January	1,275	3,211	4,795
February	1,343	2,461	2,360
March	1,587	4,393	4,369
April	2,170	4,160	6,290
May	1,968	4,619	5,613
June	2,087	3,205	4,821
July	2,515	2,742	4,088
August	n.a.	2,967	5,244
September	3,604	3,999	2,577
October	2,731	5,353	2,864
November	2,570	4,598	1,639
December	3,435	5,730	3,399
<u>Sold-1972</u>			
January	1,393	3,293	2,278
February	2,830	2,555	3,001
March	2,217	1,709	4,565
April	2,383	2,029	4,700
May	3,650	1,765	12,289
June	2,112	1,970	11,750
July	1,183	1,719	4,908
August	1,807	1,717	5,990
September	931	2,262	7,992
October	1,670	2,226	6,580
November	3,253	1,216	4,790
December	4,384	4,969	2,957

n.a. not available

*From monthly reports of the Service de l'Elevage

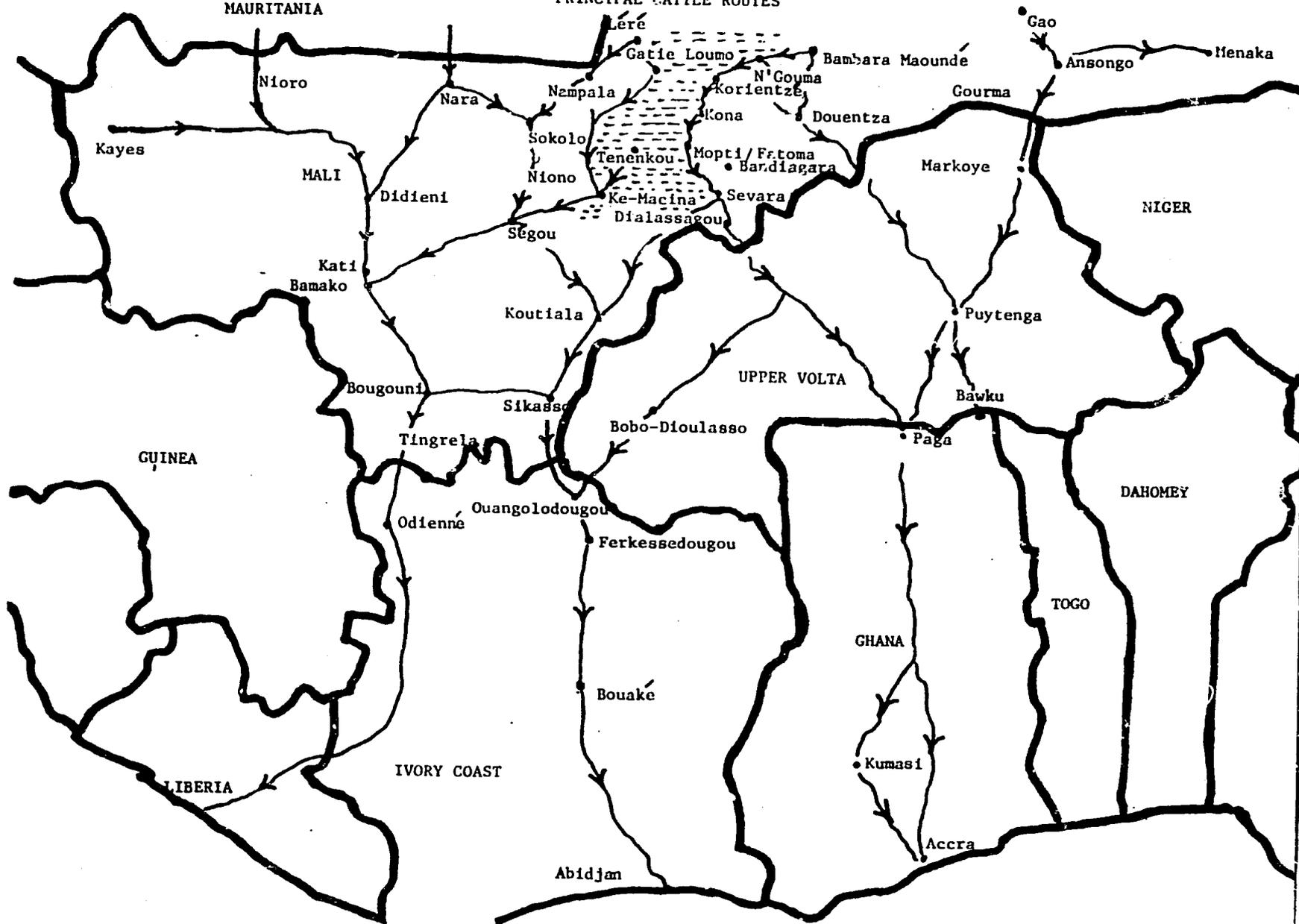
^aIncludes Fatoma and Kona

major markets. Selling at this time is apt to be particularly great if rain and pasture have been deficient, as was the case at the end of 1972, since herders are anxious to get rid of those animals in poor condition which are unlikely to survive the dry season. This seasonal variation in activity is influenced, however, by specific patterns of migration. The Mopti markets, for instance, experience their greatest levels of activity towards the end of the dry season, when cattle and their owners are concentrated in the bourgou of the Interior Delta.⁶

The principal cattle trade routes within and adjacent to Mali are indicated on Map A. To the west, most of the cattle from Mauritania are moved south towards the Kati market, where some are sold for slaughter in Bamako and others continue on to the coastal countries. A second important route starts in the extreme eastern part of Mauritania or in Mali to the northwest of the Delta. Cattle are moved from there via the Niono or Ke-Macina markets either to Bamako or, in greater numbers, to the Ivory Coast. Those going to the Ivory Coast are usually trekked to the railway at Bobo-Dioulasso or Ouangolodougou, from which they are shipped by train to the consumption centers further south. To the east of the Delta, cattle are formed into convoys at N'Gouma, Kona, and Fatoma (near Mopti) for their trek to Upper Volta, where they either continue towards Ghana or are shipped by rail to the Ivory Coast. Finally, cattle to the northeast of the Delta are either walked in relatively small numbers via Ansongo to Niger, and probably ultimately to Nigeria, or go in larger numbers to

⁶The fact that cattle and their owners are together is probably an important reason for the high level of sales in the Delta region at this time of year. During much of the rest of the year, the cattle are likely to be in the charge of herders far from the villages.

MAP A
PRINCIPAL CATTLE ROUTES



Upper Volta and on to Ghana.

The relative importance of these routes can be estimated by considering the number of cattle officially presented in the markets of each region, even though some of these animals are not sold and some may be sold more than once. On average, there were about 150,000 head per year presented in the Bamako region, 35,000 head in the Ségou region, 200,000 head in the Mopti region, and 60,000 head in the Gao region. From these data and from the less complete figures on official movements, it is possible to estimate very roughly the number of head passing along each major export route. These estimates are shown in Table 3.⁷

The number of cattle collected by a single trader, primarily in the marchés de regroupement, for the trek south depends on the amount of capital he has available. Several traders may place their herds together, however, in a single convoy of 50 to 150 head, depending on the length of the trek and on the size of the market of destination. The time required to form a convoy varies, but it may easily take up to a month. Six year old steers are preferred for these trips since they are better able to withstand the long journey to market than are younger animals and cull cows, which are

⁷One of the most important changes which has occurred in recent years has been the shift of cattle away from the routes passing through Upper Volta and toward especially the route through Sikasso and Ferkessedougou. One reason has been the decline in relative importance of the Ghanaian market. Another has been the transit tax of 1520 Malian francs per head imposed by Upper Volta, as well as long delays in waiting for railcars for shipment to the Ivory Coast.

more frequently purchased for local slaughter. Payment to the seller, who is usually another trader who has purchased the cattle in a marché de collect or smaller marché d'élevage, is often made in cash, as is payment made earlier to the herder. Frequently, transactions are effected via an intermediary, who is a witness to the legitimacy of the sale and testifies that the animals are neither stolen nor diseased and that the price is reasonable.

TABLE 3

Estimated Number of Cattle Exported per Year
by Origin, Principal Route, and Destination*
(head)

Origin	Principal Route	Destination	Number
Mauritania	Bamako	Ivory Coast	15,000
Mauritania	Segou	Ivory Coast	10,000
Mauritania	Bamako	Liberia	1,500
Mali	Kayes	Senegal	2,000
Mali	Bamako	Liberia	8,000
Mali	Bamako, Sikasso- Tingrela	Ivory Coast	20-25,000
Mali	Sikasso-Ferkessedougou	Ivory Coast	50,000
Mali	Bamako-Odienné	Ivory Coast	5,000
Mali	Mopti, Koutiala- Bobo-Dioulasso	Ivory Coast	30-35,000
Mali	Gourma, Gao, Mopti- Markoye, Puytenga	Ghana	30,000
Mali	Gourma, Gao, Mopti	Upper Volta	20,000
Mali	Gao	Niger(Nigeria?)	15,000

*From SEDES, Approvisionnement en Viandes de l'Afrique de l'Ouest, (Paris 1973), Part II, pp. 45-46.

In addition to finding a buyer, this broker may also house and feed the seller while the transaction is being completed. For these services the broker receives a commission of from 200 to 1000 Malian francs. In all, there may be five or six traders and intermediaries involved between the initial purchase from the herder and the time when the convoy is ready to proceed to the markets on the coast.

Once formed into convoys, the cattle begin their trek to market. During this trip, they average from 25 to 30 kilometers per day. There is weight loss, related both to the length of the trek and to the climatic conditions en route. This is due both to inadequate pasture and water and to the incidence of trypanosomiasis once the convoy enters the area infested with tsetse fly. There is little information, however, on the extent of this loss.⁸

Because of this weight loss, which is especially severe from trypanosomiasis in the forest zone of the south, many cattle are not trekked all the way to Abidjan but rather are shipped by rail from various points in Upper Volta or the northern Ivory Coast. The two major loading stations for Malian cattle, Bobo-Dioulasso and Ouangolodougou, handle annually about 10,000 and 20,000 head respectively. Other cattle are loaded at Bouaké for shipment to Abidjan. There are frequent complaints concerning the inefficiency of the railway in handling cattle and the 15 to 30 day wait for cars to be available. Because cattle receive no food or water while loaded, moreover, any delays at this point can prove quite costly.⁹

In 1967, it was estimated that 7 percent of the cattle going from Mali to the Ivory Coast were transported by truck. There is

⁸We were informed by traders in Segou that with good herders who know the route, cattle may arrive at the railway station in Bouaké in as good condition as when they left Mali. Others have estimated the loss at about 10 percent. In addition, there may be losses due to the death or forced sale of weaker animals, though these are generally thought to be only about 0.5 percent.

⁹It is estimated that perhaps as many as 4 out of 27 head per car may occasionally die en route in addition to the weight loss of those which survive the trip.

some indication that this proportion is increasing rather rapidly, especially during the dry season when prices are higher, weight loss is more critical, and roads are in better condition. Because of its relatively high cost, however, truck transport appears to be confined at present to better quality animals. Most cattle are hauled in general purpose trucks which hold about 10 to 15 head apiece. There may be considerable bruising en route. There are also long waits at the frontier for sanitary inspection and the payment of customs duties, as well as delays in various towns for the payment of unofficial charges.

The principal terminal markets are Abidjan and Bouaké in the Ivory Coast and Accra and Kumasi in Ghana. Transactions are effected via an intermediary and frequently on credit. Delays in receiving payment may be considerable because many of the smaller butchers do not have sufficient operating capital.¹⁰ As in Bamako, the wholesale sector is not well developed.

EFFICIENCY OF THE SYSTEM

Attention has frequently been focused on imperfections in the marketing systems of less developed countries as an important hindrance to development (4, pp. 60-66; 8, pp. 677-78). Alleged malfunctions are numerous and have been summarized for Africa by Jones (5,6). Available data permit us to examine four of these

¹⁰It has been claimed by Bishop (1, p. 17) that cattle merchants in Abidjan must "wait several months before receiving payment..." This is probably an exaggeration. Traders in Segou informed us that the period required for repayment in Abidjan was 10 to 40 days.

imperfections (6, pp. 7,8), plus an additional one commonly attributed to livestock marketing in Africa:

1 There are an excessive number of middlemen in the marketing chain, which increases distribution costs and wastes labor that could be employed more productively elsewhere. This may be because of a noneconomic preference for commercial activity and the multiple social and political, as well as economic, functions which markets fulfill (Bohannon and Dalton). In the livestock sector, it is frequently charged that brokers, in particular, do not perform any useful economic function. Closely related to this problem of excessive numbers is the argument that too much competition among traders prevents the realization of economies of scale by any of them.

2 Prices in different markets are not well related to one another due to inadequate transportation and communication infrastructure. As a result, the impact of a change in demand or supply is confined to a limited area and does not spill over easily to other markets. Resources are thus misallocated.

3 Merchants exploit consumers and producers through superior knowledge or bargaining skill and through monopoly practices. In part, this is because of the lack of standardization of units sold. Most African cattle markets are not equipped with scales, for example, and visual inspection is the only means of determining weight. The herder or small trader, who buys and sells cattle infrequently, is at a disadvantage vis-a-vis the more knowledgeable and experienced larger cattle merchant. Furthermore, there may be collusion among merchants, resulting in monopoly profits and inefficiency.

4 Capital is available on unequal terms to different market participants. This is particularly important because of the lumpiness of capital required for trade in cattle compared with agricultural crops, which can be broken down into very small units. Dependence on external credit, available only at high rates of interest, increases the cost of trading for those who cannot finance their own operations and enhances the monopoly position of those with greater financial resources.

5 Lack of adequate transportation infrastructure and a low volume of traffic mean that cattle frequently have to be walked to market. This is inefficient because of the high weight loss involved.

Each of these imperfections implies a departure from the conditions for or effects of perfect competition, and their importance is indicated by the extent of deviation from this norm. Where the conditions for perfect competition are not satisfied, we expect to find relatively few middlemen and perhaps visible evidence of collusion among these, lack of a relation between prices in different markets, inadequate knowledge of market conditions and the quality and weight of cattle being sold, nonprice rationing of capital, and unexploited economics of scale. In addition, high costs of transporting and marketing cattle in relation to sales price would indicate the importance of barriers to movement between markets. Finally, the effects of imperfect competition should be revealed by the profit margins of traders, estimated as the difference between these costs and intermarket price differentials.

Concentration and Collusion among Cattle Traders

While there is some concentration of activity in the hands of the larger cattle merchants in the major markets and along the major routes, the size of these markets and the extensiveness of cattle movements is such that the total number of traders dealing in cattle must be relatively large. The very multiplicity of routes and markets, implies a considerable degree of competition even if each market were to be totally monopolized by a small group of traders. To estimate roughly the number of traders moving cattle south, assume that each herd is comprised of 100 head and that the average length of time required to collect cattle, to move them to the consumption market, and to complete their sale is two months. This is a fairly conservative estimate which supposes that collection is left to smaller traders and that the delay in final payment is not more than thirty days. Under these conditions a trader could export a maximum of six herds or 600 head per year. With about 190,000 head being exported in total, this implies that there are over 300 such merchants. In fact, the number must be much greater since few can turn over their capital that rapidly and most send smaller herds south. An estimate of 1000 merchants engaged in exporting cattle is probably not far from the truth, though there is undoubtedly some concentration in the scale of operations among these.

That there are at least several hundred cattle merchants exporting cattle outside Mali implies that there is probably not much monopolistic activity at this stage of the distribution network, but it says nothing about other stages. In particular, a relatively high degree of monopoly power might be exercised in the initial purchase of cattle from the herder in relatively small

markets which are isolated by distance and poor communications. There is little reliable evidence concerning the number of traders to whom the herder has access in these markets or the degree of his knowledge of prices and other market conditions. Discussions with cattle owners, however, indicate that it is possible to deal with several traders at a time, even in areas where there is no local cattle market, in order to ensure that a just price is received. The very infrequency of visits by individual traders to each small market, moreover, seems to preclude effective collusion among them.

This is not true, however, of the larger markets, where monopolistic activity may be more common. In the Kati market, for example, there frequently are no more than 10 merchants conducting trade at a time. Traders coming from the north, in fact, frequently sell their cattle before arriving at Kati in order to avoid the monopoly practices there. The very capability of doing this, however, acts as a constraint on the use of that power. Since physical infrastructure in West African cattle markets is relatively unimportant, the main reason why large markets develop in fixed locations is that this promotes the spread of information concerning the prices, quality, and quantity of cattle being sold and helps to lower transactions costs. This will not occur if there are strong monopoly elements present, and traders will therefore find it to their advantage to conduct their business elsewhere.¹¹

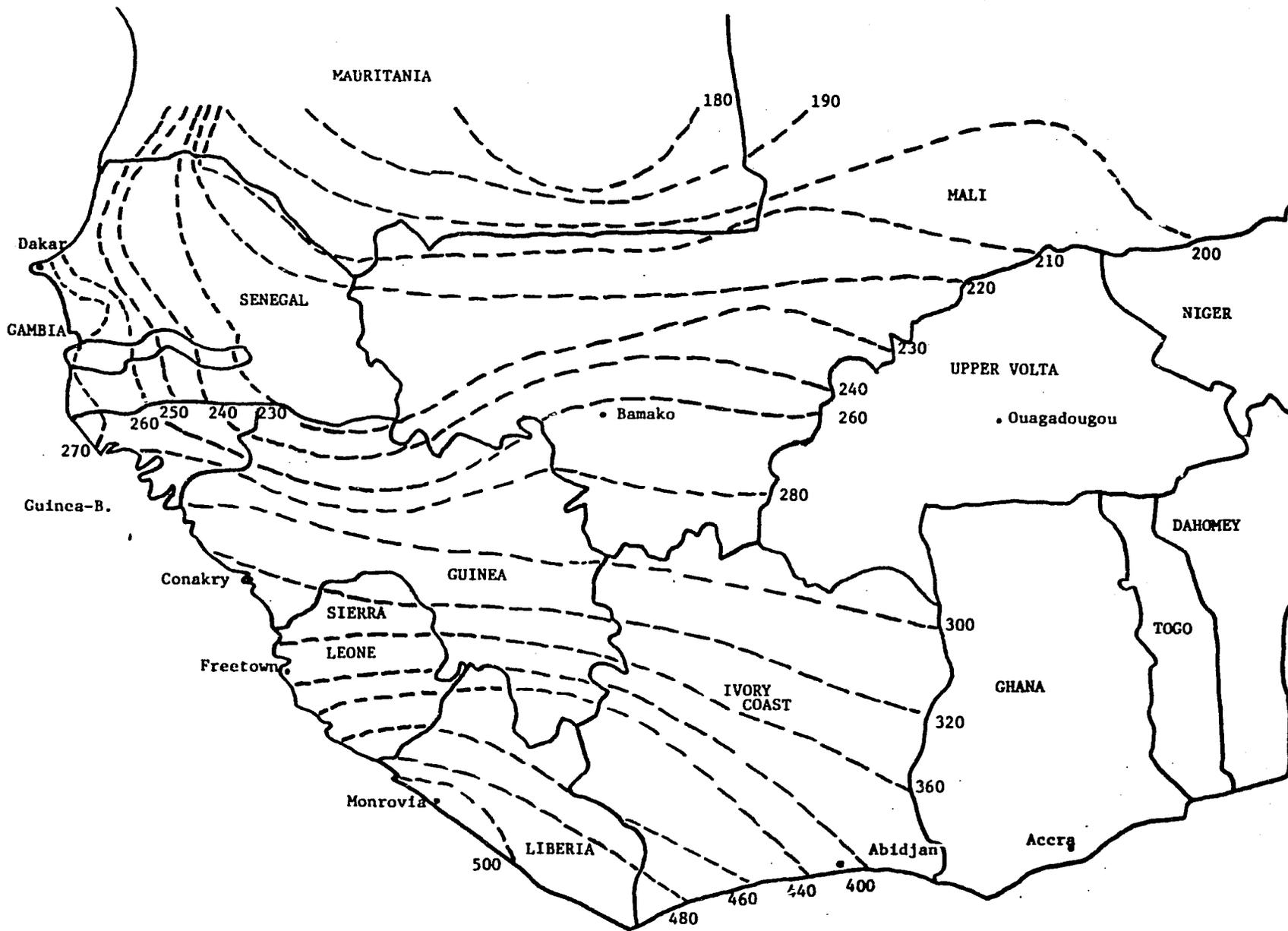
¹¹This was the case during the 1960's when severe government controls were placed on existing market activity, and merchants responded simply by shifting the location of the markets.

Spacial Price Variation

Data are regularly collected on market prices of cattle in Mali, but they do not specify quality and weight and are therefore not very useful. More specific estimates are available, however, from a recent survey of cattle markets in West Africa (10). These estimates are presented as averages in Appendix A-1 for 19 Malian markets during the period July, 1971 to June, 1972. By utilizing similar data for other West African countries, it is possible to establish a series of isoprice lines for each category of animal. Map B shows these lines for a steer of 150 kilograms, where prices are averages over the year and are measured in Malian francs per kilogram of carcass weight.

As can be seen from the map and from an examination of the table, prices tend to rise fairly regularly from north to south. There is also a tendency for prices in Bamako to be somewhat higher than would be expected from its latitude, but this is due to its importance as a consuming center. The average price per head of a first quality steer during the survey period varied from about 32,000 Malian francs in the north to about 44,000 francs at the Ivory Coast frontier. The same steer, in turn, sold in Abidjan for about 60,000 francs.

Allowing for the rather crude quality of the price data, largely because of the lack of a universal standard of measurement, the variation is in the expected direction: prices are lower in the major areas of supply and rise toward the important coastal markets. In addition, as we see later, the price differences are consistent with the costs of moving cattle between markets.



MAP B
ISOPRICE CURVES OF FIRST QUALITY STEERS, 1971-72

Information and transportation facilities thus appear adequate to maintain equilibrating flows between markets which prevent prices in different areas from getting out of line.

Cattle prices also vary substantially over the year, primarily because of changing supply conditions rather than fluctuations in demand. In general, prices per unit of carcass weight, which may change seasonally in Mali by as much as 30 to 40 percent, are lowest from October to March and rise to a peak in July and August. This is due to the weight loss towards the end of the dry season and to the migration of herds away from markets during the transhumance. Fluctuations in the coastal countries are less severe, perhaps 15 to 20 percent, probably because seasonal price variations occur at somewhat different times in the various areas supplying these markets.

Knowledge of Market Conditions

Useful information on market prices is acquired solely by word of mouth, and under these conditions we would expect the herder, farmer, or trader who deals in cattle only very occasionally in any particular market to be at a disadvantage vis-a-vis the experienced cattle merchant. An institution has developed all over West Africa, however, which deals rather effectively with this problem: the cattle broker.¹² This intermediary guarantees

¹²One of the best discussions of the role of the cattle broker in the area of West African trade dominated by the Hausa is contained in Cohen (3). Available evidence indicates a very similar role in the area to the west, identified with Dioula, or Bambara, traders.

that the animals are being properly offered for sale, that they are neither stolen nor diseased, that an appropriate price is being paid, and that the buyer will not default if the sale is on credit. The guarantee requires that the broker be well acquainted with both buyer and seller, and it is his reputation for reliability which is his most important asset. Brokers compete keenly among themselves in an effort to attract the loyalty of buyers and sellers. They are, in effect, specialists in information and are vital to the efficient working of the markets.

Credit

The degree of concentration and use of monopoly power may be greater in the provision of capital than in other aspects of cattle marketing. Although the system of informal credit in Mali is not well understood, it is clear that there are large merchants, not specialized in the cattle trade, who provide official documents and credit to the smaller traders engaged in the export of cattle, enabling them to pay cash for their purchased cattle. These large merchants, acting as bankers to the system, gain not only the interest on their capital, but also valuable access to import licenses under a special procedure used by the Malian government. We have no information on the numbers of merchants involved, the rates of interest charged, or the profits resulting from the acquisition of import licenses. It is clear, however, that any monopoly power which exists is strengthened by the severe credit restrictions imposed on the private sector by the government.

There is information, on the other hand, concerning the charge for credit made by cattle traders to butchers. In order to buy on credit for a period of up to 30 days in Mali, the butcher must pay 3000 to 5000 Malian francs for an animal costing 25,000 to 45,000 francs. This amounts to an annual rate of interest of well over 100 percent. In part, however, this is economically justified. First, there is the risk of default owing to many butchers' precarious financial position.¹³ Since the largest butchers usually pay cash and credit is required primarily by a large number of remaining butchers, each operating on a small scale, this risk is considerable. Secondly, there is the risk of loss because of the seizure of animals for health reasons, a risk born entirely by the trader. Finally, there are relatively high transactions costs associated with the cost of collecting debts and with the financial arrangements made for the sale of small numbers of cattle. Whether these economic costs are sufficient to justify this high rate of interest is difficult to say, but the restrictions on credit at its source and the evidence of monopolistic practices in some larger markets implies that some monopoly rent may be included.

Economies of Scale

There are a relatively large number of people involved in moving each animal from herder to consumer because of two major factors. First, the commercial network covers a huge, sparsely populated area, which, together with a poorly developed communication

¹³This is due, in part, to the fixing by the government of retail meat prices at relatively low levels, whereas cattle prices are determined solely by market conditions.

and transportation infrastructure, impedes the dissemination of market information and requires that cattle merchants spend a considerable portion of their time traveling between markets. Second, there are advantages in the division of labor and differences in the opportunity cost of the time of various merchants and intermediaries. As a result, an exporting cattle merchant, for example, is likely to specialize in acquiring a knowledge of price differentials in coastal and interior markets, the relative costs of different modes of transportation at different times of the year, official and unofficial procedures he must follow en route, etc. He can hardly at the same time maintain an intimate knowledge of local price conditions in each interior market or the credit worthiness of several hundred butchers in Abidjan. Nor will it likely pay him to spend days on the road traveling between small primary markets collecting a herd large enough to export.

Economies of scale, to the extent they exist, are due to the indivisibility of the individual trader or intermediary. To exploit those economies, he must specialize in the acquisition of information at some particular stage of the distribution network rather than attempt to operate over a relatively large part of the marketing chain. This results in small margins being added by a number of different traders and, frequently, in the payment of several brokers' commissions, but not necessarily in a large total commercial margin.

Butchers, traders, and herders were frequently asked why they did not bypass one or more marketing stages or deal directly with one another rather than through a broker. There appeared to

be no reason why they could not do so if they wished. Almost invariably they responded that they did not have adequate knowledge of market conditions or that it would be too time-consuming or too much trouble. Where middlemen were bypassed, it was for some particular reason. In the Kati market, for example, one important butcher bought directly from traders, but did so weekly and only with dealers traveling less than 400 kilometers whom he knew personally. In addition, merchants shipping cattle by truck remain in relatively close touch with market conditions because of the shorter turnaround time, and they sometimes dispense with broker services.

Distribution Costs and Profit Margins

Although cattle traders generally do not keep written records of particular transactions, they do know of the costs of moving cattle between markets. With this information, plus approximate price differences and some supplementary cost data, it is possible to estimate both the structure of transport and marketing costs and trading profits as a residual. This has been done for a number of different cattle routes by SEDES (10), and the results were verified by us in several instances using data obtained in the field. Detailed estimates are given in Appendix Table A-2 and notes to that table describe the assumptions upon which the estimates are based. From this table, the relative shares in the final sales value of purchase price, commercial cost and commercial profit have been calculated and are given for different trading routes in Table 4.

TABLE 4

Relative Shares of the Final Sales Value
of Cattle in Various Markets*
(%)

Market Route	Relative Shares		
	Purchase Price	Commercial Cost	Commercial Profit
Adel Bagrou-Ségou- Ferkessedougou-Abidjan	60.0	27.5	12.5
Adel Bagrou-Bamako-Abidjan	58.5	32.7	8.8
Niono-Bamako	88.5	11.3	0.2
Nara-Kati	87.1	12.1	0.9
Sevare-Sikasso-Abidjan	59.4	35.1	5.5
Niono-Ouangologougou- Abidjan	61.3	35.3	3.4
Mopti-Bobo-Dioulasso	75.9	31.4	-7.2
Mopti-Paga	68.1	35.2	-3.3
Gao-Bawku	62.2	36.7	1.1

*Derived from Table A-2.

The share going to the commercial sector varies with the distance of movement, but is generally less than 40 percent. The absolute cost per ton of carcass transported per kilometer is relatively constant, varying only between 52 and 78 Malian francs. This compares quite favorably with the cost of transporting and marketing other commodities over long distances and indicates that cattle can be moved relatively easily between markets.

The most important differences between routes are related to the levels of government taxation. This is very low for cattle from Mauritania. It is somewhat higher for cattle transported internally within Mali because of the trading license required and, for the largest merchants, the tax on profits. Cattle moved from Mali to the Ivory Coast have a very much higher level of taxation imposed on them because of the taxes and license fees required for export, amounting to about 40 percent of value added in the commercial sector. Even higher taxes are assessed on

cattle going to Upper Volta including a health tax, an import duty, and a transit tax. Finally, the taxes imposed on cattle imported into Ghana are such that they constitute over 60 percent of value added in the commercial sector.

With respect to the relative costs of transportation by trek, truck, or train, shown in Table 5, there are several observations

TABLE 5

Costs of Alternative Means of Transporting Live Cattle*
(MF per ton of carcass and offals per kilometer)

Transportation Mode	Cost of Transport	General Cost	Cost due to Weight Loss	Total Cost
Trek	12-20	20-38	18-38	50-96
Truck	40-74	10-24	10-20	60-118
Railroad	20-26	16-34	10-20	46-80

*From SEDES Approvisionnement en Viandes de l'Afrique de Ouest, (Paris, 1973), Part II, p. 146.

which might be made. First, the cash expenses of walking cattle are relatively low, but the cost of tied up capital and of lost weight are high with this method in relation to transportation by truck or railroad. Secondly, although the cost of truck transport is relatively high, it is also quite variable and can be fairly low when trucks are readily available and cattle can be used as return freight. Finally, transportation by railroad is relatively inexpensive, but there is some weight loss, cattle must be walked long distances to the railroad, and delays may outweigh other advantages.

Most cattle are transported today by a combination of trek and the railroad, truck transportation being used primarily for the heavier animals. There has been an increase in the use of trucks in recent years, however, especially when demand in Abidjan is relatively great and during the dry season when grazing along the trek routes is relatively poor. As roads improve and traffic increases, moreover, it is likely that trucking costs will decrease. In addition, an important part of the cost of trucking cattle is the delays and requirements to pay unofficial charges along the route.¹⁴ If these could be eliminated, trucking would become more profitable. Finally, trucks have a distinct advantage over the railroad in their greater flexibility with respect to both timing and location. As the commercial sector becomes more thoroughly developed and integrated, it is expected that the more skillful cattle merchants will be able to use this flexibility and speed to take increasing advantage of profitable opportunities.

Finally, the level of commercial profit estimated as a residual and indicated in Table 4 appears quite modest. This is especially so since the cost of butcher credit has been estimated at only about a 30 to 50 percent annual rate of interest, which is probably an underestimate given the high risks and transactions

¹⁴We were told by cattle merchants in Ségou that these charges amount to 25,000 to 30,000 MF compared with freight rates of 30,000 to 75,000 MF per truck.

costs involved.¹⁵ The commercial profit per head of cattle transported, after deduction for capital costs, varies between +7000 and -3000 francs, or +12.5 to -7.2 percent of the final sales price. This is relatively small compensation for the risks and effort involved and indicates little, if any, monopoly profit.

Conclusions and Policy Implications

The preceding discussion has explored several ways in which the present system of marketing Malian cattle might differ from a situation of perfect competition, implying some degree of inefficiency. This is important because the government has for several years been considering the types of intervention it might make to improve the efficiency of the system. During the socialist period in Mali, from independence until the fall of the Keita regime in 1968, the state generally played a very strong role in marketing,

¹⁵In actual practice interest charges are frequently absorbed in the sale price and are not explicitly differentiated. We were informed by traders in Ségou, for example, that they receive in Abidjan the same price for their cattle whether payment is in cash or on credit but that cash is always paid when cattle are in short supply and credit is granted when there is a temporary glut on the market. The presence or absence of credit, in this case, is a substitute for short term price fluctuations.

and this resulted in at least some disruption in the cattle trade.¹⁶ Most officials now favor less restrictive action, but there is a general belief that without some degree of state control, the marketing of cattle will be exploitative and inefficient and will fail to respond well to growing demand.

In contrast, all the evidence presented here indicates that the marketing system is quite efficient and generally free of monopolistic practices.¹⁷ It collects cattle which are widely dispersed over a sparsely populated area and moves them to the major centers of consumption at remarkably low cost. Although there is weight loss, especially when the animals are walked, this can be minimized with adequate care, and the trek is frequently the least expensive way of moving cattle, especially outside areas heavily infested with tsetse. Prices within different markets appear to be closely related to one another, and equilibrating movements clearly take place, though to what extent and with how much lag is not known.

¹⁶As noted earlier, the effect of this disruption was minimized by the lack of dependence of cattle marketing on any important physical infrastructure. If the government tried to control trade excessively, the markets were simply moved.

¹⁷This is consistent with Jones's conclusion that commodities in Nigeria subject to long-distance trade appear to be more efficiently distributed than those marketed over short distances. Here we are concerned primarily with long-distance trade. The data, unfortunately, do not permit an examination of the other part of the hypothesis, i.e., that short-distance trade in cattle is less efficient.

Monopoly practices and profits appear to be slight, except possibly in some of the larger markets. Even there the degree to which monopoly power can be exercised is circumscribed by the multiplicity of markets, routes, and traders. Finally, the sector seems to be characterized by many information specialists, whether these be traders or brokers, who act independently and prevent the commercialization of cattle from being dominated by a few large merchants, each with his own private network of information.

Some degree of monopoly control may, however, exist with respect to the supply of capital. Relatively large sums must be invested, which may be tied up for several months. Given strict rationing of formal credit by the government, many traders obtain their capital from large merchants engaged in general trade who act as bankers to the system in return for interest payments and access to import licenses. There is little information on this phenomenon, but the possibility exists that some collusion among these merchants takes place.

Otherwise, the system not only appears to be quite efficient but also has shown itself to be remarkably adaptable and responsive to changing needs. In 1971, for example, cattle exporters who were restricted from selling their animals in the interior of Ghana were able to shift quickly to the Ivory Coast market. More generally, the commercial sector was able to supply a rapidly expanding coastal market without a substantial rise in prices until 1970, when increasing demand began to press on the basic capacity of production. Even then, such evidence as we have indicates that price increases were passed back to the herder rather than absorbed in the commercial margin (10, Part II, p. 113).

The implication of this for government policy is not that improvements cannot be made, but rather that they cannot be easily identified. There may be some scope for improving access to credit and perhaps for providing some additional market and transportation infrastructure. In addition, customs and health formalities could be simplified, and action could be taken to eliminate or at least reduce informal restrictions and assessments. Beyond this, there are a host of suggestions to improve stock routes, to provide price information and quality standardization services, to organize meat trade associations and official meat markets, to improve the collection of statistics and taxes, to improve health conditions, etc. Projects designed to satisfy these goals are likely to result in improvement where a specific need has been clearly identified after careful study. At the same time, however, these measures are costly, and there is the danger that excessive efforts to control and organize the commercial sector will actually inhibit its development by diverting cattle from existing markets and reducing efficiency.¹⁸

On the other hand, the government needs to exercise some supervision over the livestock sector for at least two reasons. First, it has a responsibility to maintain animal health standards. Second, it needs to collect tax revenue which can contribute both to the general government budget and also to the further development

¹⁸As an example, it is often suggested that the activities of brokers be controlled to avoid what is believed to be their exploitation of smaller traders and herders. Yet there is no evidence that I know of which indicates that these specialists act in this way. Government control would, in this case, undoubtedly increase rather than reduce exploitation and inefficiency.

of the sector. The latter obligation is becoming increasingly important if production is to be expanded in the face of rising demand without encouraging overgrazing. Both these forms of control can probably be accomplished more easily at the marketing than at the production stage. But the desire for government regulation for these purposes should always be balanced by a perception of its potential dangers to efficiency and incentives.

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TABLE A-1

Average Cattle Price in the Principal Malian Markets, July 1971 to June 1972*
(MF/head)

Market	Exceptional Grade (220 kg)	Export Grade (180 kg)	First Quality (150 kg)	Average Quality (120 kg)	Cull Cows (100 kg)	Young Bulls (75 kg)	Poor Quality (80 kg)
Kayes	52,800	41,400	33,000	24,000	18,000	15,000	n.a.
Nara	52,800	39,600	31,500	24,000	16,000	n.a.	n.a.
Nioro	52,800	39,600	31,500	24,000	16,000	13,500	13,600
Kolokani	n.a.	45,000	36,000	n.a.	n.a.	n.a.	n.a.
Kati	66,000	48,300	39,000	27,600	22,000	17,250	n.a.
Bamako	n.a.	n.a.	42,000	30,000	24,000	18,750	n.a.
Sikasso	n.a.	52,200	42,000	28,800	23,000	18,750	n.a.
Bougouni	n.a.	n.a.	42,000	30,000	23,000	n.a.	17,600
Segou	n.a.	48,600	36,000	26,400	19,000	15,750	14,400
Niono	61,600	46,800	34,500	26,400	14,000	15,750	16,000
Tenenkou	n.a.	n.a.	33,000	25,200	12,000	15,750	n.a.
Léré	57,200	45,000	31,500	24,000	12,000	15,000	12,800
Fatoma (Mopti)	57,200	45,000	33,000	24,000	13,000	15,000	n.a.
Korientze	n.a.	45,000	31,500	24,000	10,000	n.a.	n.a.
N'Gouma	n.a.	39,600	31,500	24,000	12,000	n.a.	14,400
Douentza	n.a.	46,800	31,500	24,000	13,000	13,500	13,500
Timbuctu	n.a.	39,600	30,000	22,800	n.a.	12,000	n.a.
Gao	52,800	39,600	30,000	21,600	17,000	12,750	12,800
Ansongo	55,000	41,400	30,000	22,800	17,000	13,500	n.a.

n.a. not available

*From SEDES, Approvisionnement en Viandes de l'Afrique de l'Ouest (Paris, 1973), Part II, p. 69.

TABLE A-2

Cost of Moving Live Cattle between Major West African Markets
 Abel Bagrou-Ségou-
 Ferkessedougou-
 Abidjan
 Abel Bagrou-
 Bamako-Abidjan
 Niono-Bamako
 Nara-Kati

Sevare-Sikasso-
 Abidjan

	Cost/Head Total Cost		Cost/Head Total Cost		Cost/Head Total Cost		Cost/Head Total Cost		Cost/Head Total Cost	
	(MF)	(000 MF)								
Time Required for (days)	105-115		60-70		40-50		40-50		60-75	
Collection	30-40		15-21		20-30		20-30		20-30	
Transport	45		17		12		12		10-15	
Sale	30		30		7		7		30	
Distance Traveled (km)	1,600		1,500		300		370		1,250	
Average Carcass Wgt (kg)	160		180		140		140		160	
Size of Herd (head)	80		40		50		50		50	
Cost of Purchase	33,600	2,688	39,600	1,584	32,200	1,610	29,400	1,470	36,800	1,840
Cost of Collection ^a	500	40	500	20	600	30	400	20	400	20
Cost of Transport	6,440	515.2	14,370	574.8	980	49	1,040	52	7,920	396
Wages of herders ^b	1,000	80	1,300	52	360	18	400	20	800	40
Food for herders	600	48	600	24	200	10	200	10	300	15
Losses, forced sales ^c	840	67.2	720	28.8	360	18	340	17	320	16
Miscellaneous ^d	800	64	500	20	60	3	100	5	400	20
Ferry	--	--	--	--	--	--	--	--	--	--
Railroad	3,000	240	--	--	--	--	--	--	--	--
Truck	--	--	11,000	440	--	--	--	--	--	--
Return Trip	200	16	250	10	--	--	--	--	5,800	290
General Costs	6,250	500	5,050	202	1,940	97	2,020	101	300	15
Health tax	150	12	150	6	--	--	--	--	300	15
Customs duties ^e	1,000	80	1,000	40	--	--	--	--	4,500	225
Licenses ^f	--	--	--	--	600	30	600	30	3,000	150
Financial costs (1) ^g	4,000	320	2,800	112	1,000	50	1,000	50	3,200	160
Wage of head of convoy	600	48	600	24	240	12	300	15	--	--
Travel of merchant	500	40	500	20	100	5	120	6	240	12
Cost of Sale	2,200	176	2,200	88	600	30	600	30	2,200	110
Broker	200	16	200	8	60	3	60	3	200	10
Food for herders	400	32	400	16	140	7	140	7	400	20
Credit (2)	1,600	128	1,600	64	400	20	400	20	1,600	80
Total Distribution Cost	15,390	1,231.2	22,120	884.8	4,120	206	4,060	203	1,600	80
Value of Sale at	-56,000	4,480	67,650	2,706	37,800	1,890	33,750	1,687.5	21,760	1,088
average carcass wgt of (kg)	140		165		135		135		155	
Commercial Profit (3)	7,010	560.8	5,930	237.2	1,480	74	290	14.5	3,440	172
Commercial Profit plus Implicit Return to Capital, Trader's Labor, etc.	12,610	1,008.8	10,330	413.2	2,880	144	1,690	84.5	8,240	412
(1) + (2) + (3)										
Value Added by Commerce										
Per head of cattle	22,400	--	28,050	--	5,600	--	4,350	--	25,200	--
Per kg of carcass wgt	160	--	170	--	32.4	--	32.2	--	162.6	--

TABLE A- 2 continued

	Niono-Ouangolodougou- Abidjan		Mopti- Bobodioulasso		Mopti-Paga		Gao-Bawku	
	Cost/Head (MF)	Total Cost (000 MF)	Cost/Head (MF)	Total Cost (000 MF)	Cost/Head (MF)	Total Cost (000 MF)	Cost/Head (MF)	Total Cost (000 MF)
Time Required for (days)								
Collection	90-105		65-75		55-70		60-75	
Transport	20-30		20-30		20-30		20-30	
Sale	40-45		15		25		28	
Distance Traveled (km)	30		30		10-15		10-15	
Average Carcass Wgt (kg)	1,250		450		600		700	
Size of Herd (head)	160		150		160		160	
Cost of Purchase	50		50		50		50	
Cost of Collection ^a	36,800	1,840	33,000	1,650	36,800	1,840	33,600	1,680
Cost of Transport	1,000	50	600	30	400	20	600	30
Wages of herders ^b	5,240	262	1,200	60	1,600	80	2,100	105
Food for herders	800	40	400	20	600	30	800	40
Losses, forced sales ^c	300	15	200	10	300	15	400	20
Miscellaneous ^d	640	32	400	20	200	10	400	20
Ferry	200	10	200	10	300	15	200	10
Railroad	--	--	--	--	--	--	100	5
Truck	3,000	150	--	--	--	--	--	--
Return Trip	--	--	--	--	--	--	--	--
General Costs	300	15	--	--	200	10	200	10
Health tax	12,700	635	10,230	511.5	15,900	795	16,000	800
Customs duties ^e	300	15	600	30	600	30	600	30
Licenses	4,500	225	4,980	249	9,300	465	9,300	465
Financial costs (1) ^g	3,000	150	3,000	150	3,000	150	3,000	150
Wage of head of convoy	4,000	200	1,200	60	2,600	130	2,600	130
Travel of merchant	400	20	300	15	400	20	500	25
Cost of Sale	500	25	150	7.5	--	--	--	--
Broker	2,200	110	1,600	80	1,100	55	1,100	55
Food for herders	200	10	200	10	100	5	100	5
Credit (2)	400	20	400	20	200	10	200	10
Total Distribution Cost	1,600	80	1,000	50	800	40	800	40
Value of Sale at	21,140	1,057	13,630	681.5	19,000	950	19,800	990
average carcass wgt of (kg)	60,000	3,000	43,500	2,175	54,000	2,700	54,000	2,700
Commercial profit (3)	150		145		150		150	
Commercial Profit plus Implicit	2,060	103	-3,130	-156.5	-1,800	-90	600	30
Return to Capital, Trader's	7,660	383	-930	-46.5	1,600	80	4,000	200
Labor, etc.								
(1) + (2) + (3)								
Value Added by Commerce								
Per head of cattle	23,200	--	10,500	--	17,200	--	20,400	--
Per kg of carcass wgt	154.6	--	72.4	--	114.6	--	136	--

*From SEDES, Approvisionnement en Viandes de l'Afrique de l'Ouest (Paris, 1973), Part II, pp. 127-35.

^a Includes a market tax of 100 to 200 francs, a broker's commission of up to 400 francs, and in some cases a payment for actual collection.

^b Based on a wage of 200 francs per day and includes time required for the return trip. The number of herders required varies with the type of transport used and the breed of cattle. The relatively docile zebu require two herders for over 30 and up to 100 head when walking. The 10 to 15 head in a truck require one herder, as do the 20 to 27 head loaded on a railroad car. Taurus cattle in general require more herders.

^c Includes death and forced sales estimated at 0.5 percent, and an estimated average weight loss of about 10 percent, depending on the mode of transport and distance traveled.

^d Payments for crop damage and minor charges.

^e No tariff is charged on cattle imported from Mauritania, nor is there a transit tax on those moving toward the coastal markets, though a Mauritanian export tax of 1000 MF must be paid. Payment for cattle being exported from Mali includes an export tax of 3500 MF per head, a statistics tax equal to 2 percent of market value, and a contribution of 100 MF to help finance the operations of OMBEVI, the agency charged with central coordination of the livestock industry. The Ghanaian import duty in 1972 was equal to 5 percent ad valorem plus a 5 percent import surcharge. In contrast, there are no taxes on imports of live animals from Mali into the Ivory Coast, and the Upper Volta tariff is very low, though cattle in transit to the coastal countries must pay a tax of 1520 MF.

^f Each Malian trader must obtain a license which costs a minimum of 30,000 MF per year. If cattle are to be exported, an additional license must be obtained, though its cost is very ambiguously defined. It is assumed here that the export license fee equals 2400 MF per animal.

^g The opportunity cost of capital tied up between purchase and sale, estimated at an annual rate of interest equal to 20 percent.