

PDBAD 912
FSN 77721

626-0204

Entente

Livestock II

Report - CRED

(Shapiro)

FY 76

**LIVESTOCK MARKETING IN THE ENTENTE STATES OF WEST AFRICA:
PRELIMINARY ANALYSIS OF SALES BY HERDERS AND OF
THE PROFITABILITY OF TRADING**

**Kenneth H. Shapiro
Assistant Professor of Natural Resources
and Assistant Research Scientist, Center
for Research on Economic Development.**

PRELIMINARY DRAFT

submitted per preliminary reporting agreement

Entente Livestock Project

February, 1976

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION.....	1
II. WHY DO HERDERS SELL?.....	3
III. HAVE HERDERS BEEN SUPPLY RESPONSIVE?.....	13
IV. WHEN DO HERDERS SELL?.....	33
V. HOW ARE HERDERS LINKED TO THE MARKETING CHAIN?.....	43
VI. HOW PROFITABLE IS THE LONG DISTANCE TRADE?.....	49
VII. REFERENCES CITED.....	77

Introduction

This paper and the marketing study of which it is a part are organized around sets of specific questions that are being refined as the research progresses. The present paper deals with five questions focusing on sales by herders and on the profitability of the trade. Subsequent papers will focus on such topics as the structure of the trade, transportation alternatives, and consumption patterns.

The analyses presented here should be considered as quite preliminary, reflecting the limited data we have been able to assemble and the fact that we are at a relatively early stage in the project. Our objectives in "squeezing" the available data a bit too hard at this time are threefold: 1) to provide tentative answers to the questions addressed; 2) to help focus subsequent research, both in the field and with secondary material; and 3) to elicit a maximum of critical commentary from reviewers.

Given the above disclaimers and qualifications, the results of this preliminary draft may be summarized as follows:

1. Why do herders sell? -- Analysis of Fulani budgets reveals significant discretionary purchasing power, possibly indicating scope for supply responsiveness and contradicting assertions that herders sell only when in need of funds for food and taxes. However, consideration of all the objectives for which cattle are raised brings out the many constraints within which any "market oriented" behavior may have to operate.

2. Have herders been supply responsive? -- Analysis of cattle export, import, and slaughter data reveals that offtake rates may have risen by only one or two per cent between the early 1950's and late 1960's. This contradicts earlier findings that offtake rates rose from 7 per cent to 13 per cent during that period.

3. When do herders sell? -- Monthly data on cattle exports and imports show sales rising from September to a peak in December/January and then falling to a trough in June/July. This pattern seems to maximize the supply of heavy, healthy animals and does not necessarily place the herder at a trading disadvantage.

4. How are herders linked to the marketing chain? -- A traditional broker (dillali) often serves to assure herders of a fair price and merchants of a healthy animal that is not stolen. Price data from adjacent marketing areas does not reveal very good spatial arbitrage, perhaps indicating that these brokers do not sufficiently facilitate the flow of information

5. How profitable is the long distance cattle trade? -- Cost and return data from twenty different trade routes show an average rate of return to capital of 84.7%, significantly above the stated 20% opportunity cost of capital. There is an inverse correlation between duration of each trading venture and the rate of return; and convoys using trucks seem to be more profitable than those using trains.

As stated above, these results are tentative and shall be subjected to further scrutiny in subsequent research under this project. The policy implications of such results shall be outlined in a draft paper forthcoming in June, 1976.

Why Do Herders Sell?

Many current policies for Sahelian development implicitly assume that herders may be characterized by economic behavior patterns akin to those of "western economic man" or at least "Economic Man in Africa" (Jones, 1960). For example, planners seem to assume that economic incentives will lead Fulani groups to sell young stock to sedentary farmers for fattening; that producers will show rigorous supply responsiveness when prices rise; and that better animals will be supplied once the market develops better quality distinctions. The accuracy of these assumptions depends on producers' motivations for raising, keeping, and selling livestock .

Several anthropologists' pronouncements on herder motivations appear diametrically opposed to the assumptions underlying current planning. For example, authors of two landmark Fulani studies in Niger and Nigeria, respectively, offer the following comments:

"They get rid of their cattle only in case of emergency." (Dupire, 1965, p. 2).

"Sales take place only when there is an over-riding need for cash, for example, to buy corn in a bad dry season or to raise tax." (Stenning, 1959, p. 103).

Today's planners might note that these studies were done in the 1950's but to no avail. We have similar pronouncements in the mid-seventies from studies in Chad, Cameroun and Mali:

"Even in times of normal rainfall cattle are not raised with the objective of being sold for a profit, except in a very few cases. Rather, they are sold ... to satisfy immediate social and economic need." (Reyna, 1974, pp. 49-50).

"In general the grazier sells only when impelled by a need." (Rupp, 1965, p. 121).

In contrast to the above comments, we have the following USAID assessment:

"It is clear that the herdsmen responded with vigor to the demands of the markets (between 1941 and 1965)..." (USAID, CWR DAP, 1975, p. 42).

It is difficult to raise the level of debate much above assertion and counterassertion. We have found no detailed economic study of Sahelian herding populations. The field study by E. Eddy under this project is intended partially to fill this gap. At present the data seem limited to a few budget studies, scattered reports of when herders sell, and aggregate statistics on market sales and prices.

A major budget survey was conducted among Tuareg and Fulani groups between 1962 and 1964 north of Iahoua in Niger. A summary of sales and expenditures for the two groups is shown in Table 1. The Peul (Fulani) budget is derived from data on 3,270 households (Bororo and Farfarou) of whom 2,385 are characterized as "éleveurs seulement" and 885 as "ayant une activité agricole." (Rep. du Niger/SEDES, 1966, p. 155). The "Tuareg" budget is an average for 17,240 households comprising Touareg, Bouzou and Arabe families split almost evenly between pure herders and those with some agriculture (*Ibid.* p. 163). Unfortunately, only these averages are presented. We shall attempt to locate the detailed raw data in Paris and Niamey.

For comparison we have the four budgets shown in Tables 2 to 5 for individual families studied somewhat earlier in Niger, Mali and Nigeria. The budget from Nicolas' Tamesna study is presented as an "example" and is not easy to interpret while Scott's budget for Nigerian Fulani is based on hypotheses and extrapolation, rather than observation.

In all four Niger budgets¹ one fact stands out strongly: food and taxes account for only about one half of all monetary expenditures. The majority of other expenditures (30% to 40% of the totals) are for clothing and equipment. These allocations should be compared to the comments quoted above in

¹The budget from Mali is for a "typical" sedentary Peul family that relies on livestock for a major portion of its cash income. However, the family also seems to be self sufficient in grain and thus we have not compared its expenditure pattern to that of the other Fulani groups.

BUDGET TOUAREG

en Frs CFA - par an -

RUBRIQUES	Par ménage (en Frs CFA)	Pour la population en milliers de Frs CFA
A - RENTREES MONETAIRES		
Bétail	17.220	312.380
Artisanat	840	15.240
Vente de mil	504	9.140
Commerce	252	4.570
Remboursement de prêt	210	3.810
Autres	294	5.330
Total	19.320	350.470
B - SORTIES MONETAIRES		
Alimentation	3.780	68.570
Équipement	3.150	57.140
Habillement	4.960	89.900
Bétail	2.100	38.100
Impôts	4.620	83.900
Prêts	100	1.900
Remboursement d'emprunt	210	3.810
Dégâts des animaux	190	3.430
Tabac-natron	210	3.810
Total	19.320	350.470
C - TROC		
Petit bétail/mil	1.029	18.670
Petit bétail/sucre-thé	63	1.140
Petit bétail/petit bétail	84	1.520
Gros bétail/gros bétail	3.150	57.140
Produits divers/produits divers	42	760
Produits/Services	105	1.910
Total	4.473	81.140
D - AUTOCONSOMMATION		
Mil	8.316	150.900
Lait	20.832	377.900
Vionde	840	15.240
Total	29.988	544.040

BUDGET PEUL

En francs CFA - par an

RUBRIQUES	Par ménage (en frs CFA)	Pour la population (en milliers de frs CFA)
A - RENTREES MONETAIRES		
Bétail	15.180	53.690
Beurre	207	730
Peaux	184	650
Cadeaux	69	250
Total	15.640	55.320
B - SORTIES MONETAIRES		
Alimentation	4.968	17.570
Équipement	1.265	4.470
Habillement	3.220	11.390
Bétail	1.380	4.880
Impôts	3.910	13.830
Cadeaux	46	160
Remboursements d'emprunt	69	240
Dégâts des animaux	782	2.780
Total	15.640	55.320
C - TROC		
Bétail/Mil	2.093	7.400
Lait/Mil	276	980
Autres	23	80
Total	2.392	8.460
D - AUTOCONSOMMATION		
Mil	1.435	5.080
Lait	15.042	53.200
Viande	736	2.600
Total	17.213	60.880

Table 2

A Nigerienne Fulani Budget*

Achats :	9 charges de mil	3 000 f
	Sel de cuisine, sauce.....	400 »
	Sel pour animaux	400 »
	6 farda de natron	1 500 »
	Dattes, mais pour fête Tabaski.....	50 »
	Savon indigène.....	200 »
	10 calabasses.	250 »
	40 nattes blanches.....	1 300 »
	Canaris de terre.	100 »
	20 cuillers	200 »
	1 mortier.	85 »
	1 auge.	100 »
	1 couverture	400 »
	1 bonnet.	30 »
	1 litham.	400 »
	3 pagnes.	1 350 »
	Impôts	2 500 »
	Parures, écorces, médecines.	1 000 »
		13 265 f
Ventes :	3 vaches, 2 génisses, 1 vache.....	13 500 f
Échange :	1 bœuf contre 6 pagnes bleus et un boubou.	

*Source: Dupire, 1952, p. 133.

Table 3

A Nigérienne Tuareg Budget*

«TAMESNA» : LES IOULLEMMEDEN DE L'EST.

DÉPENSES.

Nourriture		Dépenses de mariage : N.
Homme	1 fr. par jour.	Dépenses d'héritage : N.
Femme	1	(Dépenses de repas communiels et offrandes usra 1/10 ^e -1/5 ^e) prélevée par le marabout.
Enfant (de moins de six ans)	0,75	Sacrifices des Tefaskiwin (jour de la Sura : un mouton par tente, une chèvre chez les pauvres).
Habillement homme :		Dépenses coutumières :
Blouse	20-40	Cadeaux aux pauvres et aux chefs, aux amis (à charge de contre-don).
Pantalon	10-15	8° Dépenses d'éducation des enfants. Autrefois 20.000 cauris au professeur, aujourd'hui une vache ou une génisse quand l'enfant sait le Coran, cadeau au Ttaleb ; cadeaux et prestations fréquents au professeur ; ce ne sont, en principe, pas des paiements obligatoires. Lors de la circoncision, on donne 0 fr. 50 ou 1 franc au forgeron opérateur.
Voile	25	3° Impôts et taxes :
Habillement femme :		Impôt personnel
Blouse	15-20	camelins
Pagne	25	bovins
Voile	20	équins
renouvellement deux fois par an.		ânes
3° Logement :		ovins et caprins
1 velum de tente (ehakit) et accessoires	300	Cotisation à la Société de Prévoyance : 1,25 par imposable. Taxes diverses, droits de marché, patentes . . .
Entretien (beurre, tmezgit)	25	
Réparations annuelles	50	
6° Éclairage : neant.		
Lampe-tempête européenne	15	
Pétrole lampant	30	
5° Réceptions, hospitalité	150	
6° Dépenses religieuses :		
Tames's'adeq au marabout : variable selon la fortune (1/25 ^e en général théoriquement) ; les pauvres en sont dispensés.		

(Chiffres valables pour l'avant-guerre).

*Source: Nicolas, 1950, p. 200.

Table 4

A Malian Peul Budget*

a) Monetary Receipts		
—	vente des surplus de lait, 30 F hebdomadaire	1 500 F
—	bénéfice commercial des noix de cola	30 000 F
—	part annuelle des ventes d'animaux,	14 000 F
		45 500 F
	soit 43 % du revenu global	
b) Expenditures		
—	impôt, 3 imposables et taxes sur le bétail,	2 400 F
—	habillement :	
	Allaye 2 boubous,	2 500 F
	3 pantalons,	900 F
	2 bonnets,	70 F
	chaussures,	250 F
	1 chèche!	300 F
	son épouse	
	2 chemises,	500 F
	2 boubous,	700 F
	2 pagnes,	500 F
	3 façons de coiffure	150 F
	Ahmadou	
	1 boubou,	200 F
	Total :	5 970 F
—	couvertures : la laine nécessaire pour trois couvertures <i>kassa</i> a été achetée à Yonga pour 1 000 F, filée par la femme, tissée par le <i>mabo</i> moyennant 100 F la <i>kassa</i> , soit	1 300 F
—	fêtes	
	le mouton annuel	800 F
	offrande de cola	100 F
—	Total des dépenses en espèces	10 570 F
c)	<i>solde en espèce</i> :	30 000 F

*Source: Gallais, 1967, pp. 403-404.

Table 5

A Nigerian Fulani Budget

**A. ESTIMATED ANNUAL VALUE OF OUTPUT FOR SUBSISTENCE
AND SALE OF FULANI HOUSEHOLD WITH HERD OF**

20 CATTLE, c. 1930

Composition of household: c. 5 adults plus children

	<i>Home Consumed</i>			<i>Marketed</i>		
	<i>£</i>	<i>s.</i>	<i>d.</i>	<i>£</i>	<i>s.</i>	<i>d.</i>
Stock ¹ - - - - -				2	12	0
Dairy produce ² - - - - -	3	5	0	3	5	0
Manure (included in crop value) - - - - -				10	0	
Farm crop - - - - -	1	0	0			
Spinning - - - - -				5	0	
	<hr/>			<hr/>		
	£4	5	0	£6	12	0
				£10 17s. 0d. ³		

B. ESSENTIAL NEEDS FOR A TYPICAL FULANI HOUSEHOLD

	<i>£</i>	<i>s.</i>	<i>d.</i>
Additional grain supplies - - - - -	1	15	0
Meat - - - - -		10	0
Salt and relishes - - - - -		5	0
Natron and bran for stock - - - - -		10	0
Clothing - - - - -		15	0
	<hr/>		
	£3	15	0

Notes: From the balance of £2 17s. there has to be paid not only the cattle tax (*jangali*), which at the reduced rate of 1s. 6d. introduced in some areas in the early 'thirties would amount to £1 10s., but also the general head tax payable by all farming Fulani which would probably amount to another 5s. or 10s. according to the number of taxable males in the household. Thus, a margin of only £1 or less would remain for all 'non-essential' expenditure and emergencies, while at the earlier *jangali* rate of 2s. per beast practically no margin would exist.

*Source: Forde and Scott, 1946, pp. 206, 208.

which livestock sales were said to be made only in emergencies or when herders were in immediate need of cash to pay taxes or buy food.

If the above budgets are accurate and if we may characterize clothing, equipment and other miscellaneous items as discretionary purchases within any one year, then herders' reasons for selling might be reconsidered. Herders' desires for discretionary items on the one hand, and their ability to delay or move forward their time of purchase on the other hand, would seem to provide scope for herder responsiveness to livestock price variation. That is, to the extent that sales are not made solely when in need of cash for food or taxes, herders may be able to time their sales over seasons or over years so as to receive the best prices.¹

But the presence of discretionary purchases in herder budgets clearly is not sufficient grounds to shift to a profit maximizing model of herder behavior. Other factors may limit the seeming discretion of those purchases. One of these is the impact of climatic seasonality, which is discussed below. Another more general factor is the set of objectives for which cattle are raised, cash purchases being only one element in the set. These objectives have been cited in numerous studies and bear repeating here to serve as a reminder of the constraints within which "market oriented" behavior may operate.

The size, structure and offtake pattern of Sahelian herds is shaped by at least the following set of herder objectives:

1. Production of milk which is the basis of a herder's livelihood;
2. Production of manure for own fields or for exchange with other farmers' grain;
3. Maintenance of sufficient old stock which have proven their survival ability and which can thus form the basis for herd reconstitution following unusual loss from drought or disease;

¹If Scott's assumptions for the Nigerian Fulani budget are accurate and generalizable, then that budget would strongly contradict the finding of significant discretionary purchases.

4. Possession of enough animals so that unusual loss will not mean complete loss;
5. Possession of enough animals so the herd can be divided and pastured in different areas in order to decrease risk;
6. Maintenance of savings in a form that bears interest and is relatively secure from theft (compared to cash);
7. Maintenance of wealth in a portable form to permit movement in response to climatic or political difficulties;
8. Achievement of social prestige;
9. Provision of livestock for bride wealth and for bequests;
10. Sales of livestock to permit purchase of items indicated in the above budgets.

Harold Schneider (1968) provides an additional insight into herder rationality by noting that among the Turu and other East African groups livestock may be considered as money (Schneider, 1968 , p. 427, 441-442).

"In Turu, cattle, together with small stock, are media of exchange and standards of value as well as stores of value, and they can be converted into wives, grain, honey, iron goods, land, services and many other less important items. But cattle are the "big notes" of the system, and since in themselves they lack divisibility, small stock rest in a standardized ratio to them, so that three smaller animals always equal a young bull or steer, or five head of small stock equal a heifer. Because of this it is possible to translate wealth into livestock units, each unit being one small animal. This system of equivalents is overtly known to the people and is so used that, for example, when discussing the inheritance of one heifer by two sons, it will be converted into five small animals. In a similar way, when explaining bride wealth payments a person will speak of having paid an njiku (steer) when in fact he actually paid three small animals."

"The prestige that derives from the ownership of cattle is everywhere based on the feeling that a man who has many animals is to be admired for his superior control of resources. While it is not possible to say that the prestige inherent in the possession of cattle is nothing but pecuniary, it does not seem possible any longer to entertain the notion that it is purely non-economic."

If Schneider is correct, then the analysis of herders' market behavior becomes more complex. It no longer suffices to search for a "western" economic rationality, however constrained. We must now consider how profit maximizing behavior would be manifest if profit is measured in units (animals)

that simultaneously are factors of production. Sale of an animal converts a man's holdings from one form of money (animals) into another, cash. But cash has only a few advantages over a live animal: it can purchase certain consumer goods not available through barter; it can pay taxes; and it is divisible. On the other hand, live animals and not cash are needed to satisfy most of the objectives listed above. Furthermore, the advantages listed for cash can be obtained from a herd's surplus milk, although such surplus may be small and certainly its rate of extraction is not conducive to amassing a large lump sum of cash for major purchases or tax payments.

If we follow Schneider's logic along with the objectives listed above, and also consider the limitations that nomadic life places on the accumulation of consumer durables (see Sahlins, 1972, p.), we must then treat seriously the possibility that Sahelian herders may have a very limited desire to sell animals . Of course, "very limited" may be sufficient for the objectives of proposed policies, but planners might wish to be cautious. Below we attempt to assess prior livestock supply responsiveness, but the data are poor, and the past may not foretell the future in that the last twenty years probably saw a larger increase in the need for cash than will occur in the next twenty years.

Have Herders Been Supply Responsive?

The a priori arguments presented above should be tested against the data on herders' past supply responsiveness. Unfortunately, data now available to us do not permit rigorous estimation of Nerlovian supply response equations. However, less precise but still interesting observations can be drawn from the available data.

One of the most striking observations found in the literature is that herders have significantly increased the rate of offtake in response to increasing market demand, increasing herd size, and lowered risk of disease. According to AID (USAID, DAP, Upper Volta and Niger, 1975 p. D-34) the pastoralists increased "herd offtake from 7 per cent in the early 1950's to 11-13 per cent in the last 1960's." These figures are cited for Upper Volta and then again for the entire CWR region (USAID, DAP, CWR, 1975 p. 42). Their source appears to be a 1974 study by Robinet which we have been unable to locate.

As indicated in the following passages, SEDES is also of the opinion that offtake rates have increased sharply. (SEDES, 1969, p. 20).

"La couverture des besoins grandissants a, jusqu'alors, été essentiellement assurée par une modification des modes d'exploitation: rajeunissement de l'âge d'exploitation, réduction de l'autoconsommation rurale au profit du secteur monétaire urbain. C'est donc l'accroissement de la commercialisation qui a permis de faire face à la demande monétarisée beaucoup plus que l'augmentation de la production."¹

The paucity of data makes it difficult to verify absolutely the above observations regarding increased rates of offtake. However, some weak verification may be attempted by consistency checks. For example, we may check whether the rate of offtake, the net rate of herd growth, the gross (preofftake) rate of herd growth, the growth rate of animal exports, and the growth rate

¹To the extent that herders respond by selling more young stock for domestic consumption, the growth of exports and of domestic tonnage would not increase as rapidly as predicted by the following analysis.

of domestic meat consumption are all consistent. What follows is a first, rough attempt at such a check.

If the above rates of offtake refer to the net herd size (S_{N1}) of the previous year, the following relationship exists:

$$(S_{N1})(H) + (S_{N1})(N) = (S_{N1})(G) \quad (1)$$

$$\text{or } H + N = G$$

where

H = rate of offtake or harvest

N = net growth of the herd after offtake

G = gross rate of herd growth

If the harvest rate refers to the herd size (S_{G2}) following the current years natural or gross increase, then a different relationship holds:

$$S_{G2} - (S_{G2})(H) = S_{N2} \quad (2)$$

or

$$[S_{N1} + (S_{N1})(G)] - (H)[S_{N1} + (S_{N1})(G)] = S_{N1} + (S_{N1})(N)$$

or

$$(1-H)(1+G)(S_{N1}) = (1+N)S_{N1}$$

or

$$G = \frac{1+N}{1-H} - 1$$

The number of animals sold (C) for consumption would be related to the above parameters as follows for relationship (1):

$$C = (S_{N1})(H); \quad (1A)$$

and for relationship (2):

$$C = (S_{N1})(G)(H) \quad (2A)$$

We can use these relationships to determine whether the aforementioned offtake rates are consistent with available data on herd growth and sales.

We have not attempted to develop our own data series or to revise those available in the literature. Rather, for this preliminary draft we use the data that are presented, primarily in reports by the Société d'Etude pour le Développement Economique et Sociale (SEDES). In their 1969 study of the Entente States, SEDES indicates their basic agreement with the following official statistics on the net rate of herd growth in Upper Volta and Niger:

Table 6

Net Rate of Herd Increase

Niger:	1946 - 1956	4% per year
	1956 - 1966	1 1/2 % to 2% per year
Upper Volta:	1952 - 1959	5.2% per year
	1959 - 1964	2.4% per year

Source: SEDES, 1969, pp. 24, 26, 66.

We are lacking similar estimates for Mali, the other major producing country considered in this exercise. The rates of net herd increase along with the aforementioned rates of offtake imply specific rates of gross herd growth and sales according to relationships (1) and (2). These are shown in Table 7.

The variations shown in Table 7 stem from varying assumptions regarding the net growth of the herds. Depending on which assumptions are used and whether the time period is 1954-1964 or 1954-1968, the posited increase of offtake rates implies an average annual growth of sales between 9.3% and 16.7% per year.

Table 8 shows the "actual" growth of sales derived from a variety of data on exports, imports, slaughter, and sales. Most of those figures show growth rates well below those implied by the posited increase of offtake rates.

Fourteen rates of growth were less than 3% per year, four were between 5% and 7%, one between 7% and 8%, and only two over 9%¹. These lower growth rates

¹

We should note that these are two important sets of data: estimated total exports from Mali and beef consumption in 12 Ivory Coast towns. However, the Mali data seem rather suspect. For example, total exports from Mali are seen to increase by about 50,000 head or 42% in just one year.

Table 7

Growth of Sahelian Cattle Sales Implied by Earlier Findings^{1/}
on Net Herd Growth and Increases in Offtake Rates

Equation 1 with Alternative Assumptions

<u>Year</u>	<u>N</u>	<u>H</u>	<u>Implied G</u>
1954	.03	.07	.10
	.04	.07	.11
	.05	.07	.12
1964	.02	.113	.133
	.03	.113	.143
	.04	.113	.153
1968	.03	.13	.16

Equation 1A with Alternative Assumptions

<u>Year</u>	<u>Herd Size Index</u>	<u>H</u>	<u>Implied C</u>
1954	100	.07	7.0
1964	120	.113	13.56
	130	.113	14.69
	140	.113	15.82
1968	128	.13	16.64
	142	.13	18.46
	156	.13	20.28

Equation 2 with Alternative Assumptions

<u>Year</u>	<u>N</u>	<u>H</u>	<u>Implied G</u>
1954	.03	.07	.108
	.04	.07	.118
	.05	.07	.129
1964	.02	.113	.150
	.03	.113	.161
	.04	.113	.172
1968	.02	.13	.172
	.03	.13	.184
	.04	.13	.195

Table 7 (continued)

Equation 2A with Alternative Assumptions

<u>Year</u>	<u>Herd Size Index</u>	<u>G+1</u>	<u>H</u>	<u>Implied C</u>
1954	100	1.108	.07	7.756
	100	1.118	.07	7.826
	100	1.129	.07	7.903
1964	120	1.12	.113	15.187
	120	1.15	.113	15.594
	120	1.161	.113	15.743
	120	1.172	.113	15.892
	130	1.12	.113	16.453
	130	1.161	.113	17.055
	140	1.12	.113	17.718
	140	1.161	.113	18.367
1968	128	1.12	.13	18.64
	128	1.172	.13	19.50
	142	1.12	.13	20.68
	142	1.184	.13	21.86
	156	1.12	.13	22.71
	156	1.195	.13	24.23

Implied Sales Growth Rates^{2/}

		<u>1954-1964</u>	<u>1954-1968</u>
Equation 1A	Minimum	9.3%	9.8%
	Maximum	12.6%	13.6%
Equation 2A	Minimum	9.2%	9.7%
	Maximum	10.8%	16.7%

Notes:

^{1/} See preceding text for equations and notation.

^{2/} Average annual rate of growth.

Table 8

GROWTH IN CATTLE EXPORTS, SLAUGHTER, AND CONSUMPTION¹

1. Net Cattle Exports from Upper Volta

1954 - 56	=	53,333 (head)
1964 - 66	=	<u>58,051</u>
	+ 4,718	= 8.85%
		or .885% per year

2. Cattle Exports from Niger to Nigeria

A. Controlled	1953 - 55	=	74,050 (head)
	1964 - 66	=	<u>55,413</u>
		-	18,637 = 25.17%
			or -2.29% per year

B. Estimated Total	1953 - 55	=	130,000 (head)
	1964 - 66	=	<u>146,667</u>
		+ 16,667	= 12.8%
			or +1.17% per year

3. Mali Cattle Exports

A. Controlled	1953 - 55	=	44,039 (head)
	1967 - 69	=	<u>52,324</u>
		+ 8,285	= 18.8%
			or +1.3% per year

B. Estimated Total	1953 - 55	=	68,333 (head)
	1967 [*] - 69	=	<u>162,666</u>
		94,000	= 137.6%
			or +9.8% per year

¹Where more than one year is indicated, the figure is the annual average for those years.

* interpolated from 1966 - 68

Table 8 continued:

4. Controlled Cattle Slaughter in Mali¹

A. Bamako	1953 - 55	= 18,560 (head)
	1967 - 69*	= 26,170
		<u> </u>
		+ 7,610 = 41.0%
		or +2.9% per year

B. All Mali	1953 - 55	= 44,536 (head)
	1967 - 69	= 67,640
		<u> </u>
		+ 23,104 = 51.9%
		or +3.7% per year

5. Controlled Cattle Slaughter in Mali²

A. Bamako	1960 - 62	= 31,095 (head)
	1967 - 69	= 35,726
		<u> </u>
		+ 4,631 = 14.9%
		or +2.1% per year

B. Six Centers Including Bamako

	1960 - 62	= 62,192 (head)
	1967 - 69	= 68,074
		<u> </u>
		+ 5,882 = 9.5%
		or +1.4% per year

* Comparing 1953 - 1955 with 1963 - 1965 shows an 8.3% average annual growth rate. These average changes are obviously less satisfactory than a fitted trend which will be calculated for subsequent drafts.

¹ SEDES figures

² Data from Mali Dossiers d'Information, Mars, 1974

Table 8 continued:

(3&4A) Mali Controlled Slaughter and Exports

A. Controlled Slaughter & Controlled Exports

1953 - 55 = 88,575 (head)
1967 - 69 = 119,964
+ 31,389 = 35.4%

or +2.5% per year

B. Controlled Slaughter & Estimated Total Exports

1953 - 55 = 112,869 (head)
1967 - 69 = 230,306
+ 117,437 = 104.0%

or +7.4% per year

6. Recorded Ghana Cattle Slaughter

1955 - 57 = 75,000 (head)
1967 - 69 = 53,333
- 21,667 = 28.9%

or -2.4% per year

7. Meat Consumption at Bobo-Dioulasso (metric tons)

1954 = 1,197
1964 - 66 = 1,946
+ 749 = 62.6%

or 5.7% per year

8. Beef Consumption in 12 Ivory Coast Centers (metric tons)

1960 = 5,649
1966 = 10,243
4,594 = 81.3%

or +13.6% per year

Table 8 continued:

9. Total Beef Consumption in Ivory Coast (metric tons)

1959 = 18,750

1966 = 27,900

+ 9,150 = 48.8%

or +6.97% per year

10. Beef Imports to Ivory Coast from Ghana (metric tons)

1960 = 21,250

1966 = 13,375

- 7,875 = 37.1%

or -6.2% per year

11. Imports to Ghana (metric tons)

1960 = 35,000

1966 = 18,000

- 17,000 = 48.6%

or -8.1% per year

12. Beef Consumption in Ghana (metric tons)

1960 = 28,750

1966 = 20,250

- 6,500 = 22.6%

or -3.8% per year

13. Controlled Cattle Slaughter in Major Ghanaean Centers

1961 = 42,600 (head)

1966 = 39,600

- 3,000 = 7.0%

or 1.4% per year

Table 8 continued:

14. Cattle Imports into Togo (metric tons)

1962 = 1,540

1966 = 1,940

+ 400 = 25.97%

or +6.5% per year

15. Beef Consumption in Togo (metric tons)

1962 = 3,200

1966 = 4,015

+ 815 = 25.5%

or +6.4% per year

Table 8 continued:

Upper Volta, Niger¹, Mali² Exports:

1953 - 55/3 = 251,666

1963 - 65/3 = 367,384

115,718 = 45.98%

or 4.6% per year

¹ Est. total

² Est. total (SEDES)

are consistent with a much slower rise in the offtake rate than is posited by the aforementioned sources.

The data from which these sales growth rates are derived are presented in Tables 9 to 22. These data are too rough to justify much detailed analysis, but perhaps one more step is worthwhile.

According to the available data, total estimated cattle exports from Upper Volta, Niger and Mali rose by an average rate of 4.6% per year between 1953-1955 and 1963-1965. This rate of increase is consistent with a 1963-65 offtake rate of between 6.3% and 8.5% depending on assumptions regarding net growth rates. If the 4.6% annual growth of sales extended through 1968, this would be consistent with a 7.1% to 9.0% offtake rate in that year. Thus, rather than the dramatic increase of offtake rates posited by AID, SEDES, and Robinet, the sales data seem to imply no increases or only very modest ones.

Given the rough state of the data, this conclusion should be treated as very tentative. However, it does indicate that one might wish to be very cautious in developing policies that rely on herders' supply responsiveness which is inferred from the posited sharp increase of offtake rates between 1954 and 1968. That increase may not have occurred.

Table 9

Cattle Exports From Upper Volta

Unité : tête de bétail

ANNEES	Sorties totales A	Entrées totales (1) B	Exportations nettes B - A	Observations Sources
1954	102.000	55.000	47.000	Comptes économiques SEDES " " " " " " " "
1955	101.000	49.000	52.000	
1956	106.000	45.000	61.000	
1957	123.000	67.000	56.000	
1958	130.000	95.000	35.000	
1959	138.000	83.000	55.000	Service de l'Élevage. Rapport annuel 1958 SEDES DURANT
1960	128.000			
1961	140.000			
1962	164.000			
1963	175.000			
1964	115.500	74.900	40.600	Comptes économiques 1964. Circonscription d'élevage (2) Données officielles - Présente étude
1965	136.551	73.000	63.500	
1965	213.271	143.217	70.054	
1966	165.000	100.000	65.000	
(1) Transits et importations estimés. Aucune estimation n'est présentée pour les années où le chiffre des importations est douteux.				
(2) Total établi par les auteurs				
1966	250.000	160.000	90.000	Hypothèse du Plan Cadre

Source: SEDES, 1969, p. 74

Table 10

Cattle Exports from Niger to Nigeria

Unité - Tête de bétail

ANNEES	Exportations contrôlées					Exportations estimées par le Service de l'Élevage
	Ouest (1)	Tohouo	Maradi	EST Zinder Diffa	Total	
1950	26.398	17.450	3.595	9.210	56.653	
1951	8.449	25.016	3.731	20.109	57.305	
1952	19.376	25.608	7.353	17.891	70.228	
1953	25.236	39.450	12.271	14.479	92.436	130.000
1955	-	27.853	10.680	-	55.664	130.000
1958	-	16.091	11.029	12.695 *	42.122	125.000
1960	-	18.064	12.546	13.597 *	-	-
1961	-	18.203	11.637	12.027 *	-	-
1962	5.000 ?	16.961	13.316	11.728 *	47.911	140.000
1963	4.500 ?	16.694	8.611	7.643 *	47.288	140.000
1964	-	-	9.624	4.374 *	46.129	140.000
1965	-	-	10.267	17.057	61.942	150.000
1966	3.393	22.926	10.389	21.459 (2)	58.167	150.000
Estimation des auteurs 1966	20.000	45.000	31.000	82.000	Total estimé :	179.000

(1) Obtenu par différence quand cela est possible.

(2) Zinder 11.476 + Diffa 9.983

* Zinder seulement.

Source: SEDES, 1969, p. 46.

Table 11

Malian Imports, Exports, and Transits of Cattle, 1952-1971*

Year	Imports		Exports		Transits ^a
	Controlled	Estimated ^b	Controlled	Estimated ^b	Controlled
1952	7,066	n.a.	39,202	n.a.	n.a.
1953	6,444	9,000	46,216	66,200	n.a.
1954	8,262	19,000	51,149	75,500	n.a.
1955	9,368	16,000	34,752	63,300	n.a.
1956	17,109	n.a.	30,134	n.a.	n.a.
1957	24,009	n.a.	42,195	n.a.	n.a.
1958	3,426	16,000	44,431	n.a.	n.a.
1959	3,930	n.a.	40,229	88,800	n.a.
1960	n.a.	n.a.	38,237	n.a.	n.a.
1961	3,895	6,000	47,923	104,898	n.a.
1962	3,317	3,500	47,144	82,470	n.a.
1963	3,889	n.a.	64,604	117,074	n.a.
1964	3,200	25,000 ^c	80,914	167,000	n.a.
1965	n.a.	n.a.	60,601	120,500	n.a.
1966	4,745	28,000 ^d	32,448	156,000	n.a.
1967	6,124	n.a.	43,125	n.a.	21,470
1968	1,516	n.a.	37,393	160,000 ^g	22,916
1969	1,840	n.a.	76,453	170,000 ^h	29,929
1970	2,630	n.a.	81,718	190,000 ^h	27,161
1971	2,064	n.a.	83,384	n.a.	35,924

n.a. not available

Source: SEDES, 1973, Part I, pp. 549,-50,-57 as quoted in Stryker, August, 1975, Appendix

Table 12

Controlled Slaughter of Cattle and Number of Cattle Presented on the Markets
1952-1971*
 (head)

Year	Bamako	Slaughter All Mali	Presented All Mali
1952	16,124	35,629	108,222
1953	17,779	40,861	n.a.
1954	18,371	44,211	131,853
1955	19,531	48,538	132,258
1956	21,007	n.a.	142,430
1957	21,666	56,182	209,132
1958	21,134	54,090	223,018
1959	23,345	56,965	n.a.
1960	n.a.	n.a.	n.a.
1961	27,991	65,678	n.a.
1962	n.a.	65,536	n.a.
1963	31,602	72,519	n.a.
1964	35,520	n.a.	n.a.
1965	34,851	n.a.	n.a.
1966	32,868	67,737	n.a.
1967	25,500	59,947	456,755
1968	24,208	63,355	338,647
1969	28,803	79,619	502,801
1970	37,103	78,332	418,147
1971	31,341	73,779	442,080

n.a. not available

Note: Figures for Bamako include those of peripheral markets around that city after 1968.

Source: SEDES, 1973, Part I, pp. 363, 65 as quoted in Stryker, August, 1975, Appendix.

Table 13

Controlled Cattle Slaughter in Mali*
(head)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
<u>Kayes</u>													
B	11 818	13 568	15 641	12 337	10 752	7 852	9 735	8 760	9 398	14 193	14 354		
O C	40 941	15 576	15 614	9 838	10 274	4 685	4 754	4 511	5 176	6 954	6 913		
<u>Bamako</u>													
B	33 901	35 296	24 087	38 806	44 371	44 362	41 588	33 021	34 538	39 619	38 626		
O C	34 583	37 430	41 646	36 530	34 055	23 225	14 944	14 831	16 452	28 503	38 837		
<u>Sikasso</u>													
B	3 954	4 446	4 940	6 091	6 540	5 430	4 868	5 564	5 697	6 267	6 990		
O C	681	835	1 150	1 669	1 999	2 180	2 619	4 325	3 971	5 689	7 206		
<u>Ségou</u>													
B	3 091	4 250	5 191	5 564	5 137	4 979	4 490	3 709	4 003	4 558	6 620		
O C	16 566	24 049	24 268	19 074	19 224	16 156	14 547	12 437	11 882	17 120	35 359		
<u>Kopti</u>													
B	3 283	3 135	3 678	3 862	3 964	3 397	3 832	4 295	4 677	5 666	6 496		
O C	27 610	31 067	32 187	28 719	32 427	22 889	21 628	20 793	22 379	22 964	20 051		
<u>Koulikoro</u>													
B	4 569	4 928	5 899	5 863	6 904	6 605	5 044	5 152	6 713	8 130	7 262		
O C	27 420	31 249	29 815	25 709	32 578	17 188	13 091	12 456	14 737	14 904	22 092		
<u>Total</u>													
B	61 516	65 623	59 436	72 523	77 668	72 625	69 557	60 501	65 026	78 696	80 348	83 000	87 000
O C	147 791	140 206	144 680	121 539	130 557	86 273	72 583	69 353	74 597	73 696	140 458	173 000	179 000

*Source: Mali, Dossiers d'Information, March, 1974.

B : Bovine

O,C: Ovine, Caprine

Table 14
Meat Consumption in Bobo-Dioulasso, Upper Volta*

Unités: nombre d'habitants - tonnes carcasse - kg de carcasse

ANNEES	Tonnage disponible à la consommation	Population recensée ou estimée (1)	Consommation moyenne par habitant en kg
1948	705	37.500 dont 1.144 expatriés	18,8
1954	1.197	42.000 Étude Larrot	25,5
1955	1.009	44.800 dont 1.455 expatriés.	22,3
1960	1.331	51.000 dont 1.500 expatriés	26,1
1961	1.627	53.000	30,7
1962	1.502	55.000	27,3
1963	1.620	58.500	27,6
1964	1.913	62.500	30,6
1965	1.925	64.000	30,1
1966	2.000	68.000 dont 1.000 expatriés	29,4

(1) Estimations officielles soulignées - Autres estimations interpolées

*Source: SEDES, 1969, p. 80.

Table 15
Meat Consumption in Twelve Urban Centers in the Ivory Coast*

Rubriques	1960	1966	Accroissement en %
Population des 12 centres (milliers d'habitants)	375	652	+74%
Tonnages abattus localement (en tonnes):			
Viande bovine	5.649	10.243	+81%
Viande ovine	240	405	+69%
Viande porcine	221	417	+88%
Total viande carcasse (tonnes)	6.110	11.065	+81%
Abats correspondants (tonnes)	1.472	2.663	+81%
Tonnages de viandes foraines	578	2.011	+248%
Consommation globale de viande et abats (tonnes)	8.160	15.739	+93%
Consommation individuelle de viande et abats (en kg. par an)	21,8	24,1	+11%
Viande carcasse locale	16,3	17,0	+ 4%
Viande foraine	1,5	3,1	+107%

*Source: SEDES, 1969, p. 121.

-30
Table 16

Meat Consumption in the Ivory Coast*

Unités - Tonnes - Kg/œn - Pourcentage

PRODUITS	Disponibilités globales (en tonnes)		Consommation individuelle (kg per œn) (a)		Accroissement des disponibilités globales en 1966 par rapport à 1959 en %
	1959	1966	1959	1966	
Viande et abats de bovins	18.750	27.900	5,7	6,3	+ 49%
Viande et abats ovins-caprins	4.600	11.070	1,4	2,5	+ 124%
Viande et abats de porcins	1.320	2.200	0,4	0,5	+ 66%
Viande foraine importée	455	2.100	0,1	0,5	+ 352%
Total viande et abats	25.125	43.270	7,6	9,8	+ 72%
Volaille	5.100	9.000	1,5	2,0	+ 76%
Poisson (équivalent poisson frais)	47.000(b)	77.120	13,4	17,4	+ 64%
Conserves de viande	410	470	0,1	0,1	+ 15%

Notes: (a) Les chiffres retenus pour la population sont de 3.360.000 habitants en 1959 et 4.430.000 habitants en 1966.

(b) Pour le poisson, les données disponibles s'appliquent à l'année 1960; elles sont extraites du rapport LAGOIN-SALMON déjà cité; les données pour 1966 sont extraites du rapport annuel du service des pêches.

*Source: SEDES, 1969, p. 120 Table 17

Meat Imports from Ghana to the Ivory Coast*

Unité-Tonne

Produits	1966 (tonnes)	1960 (tonnes)	Variation en 1966 rapport à 1960 en %
Bétail importé vivant			
Bovins			
carcasse	10.700	17.000	
abats	2.675	4.250	
TOTAL	13.375	21.250	-37%
Ovins-Caprins			
carcasse	1.037	3.700	
abats	155	550	
TOTAL	1.192	4.250	-72%
Total bétail vivant			
carcasse	11.737	20.700	
abats	2.830	4.800	
TOTAL	14.567	25.500	-43%
Viande foraine(1)	1.218	1.755	-31%
Conserves et charcuterie	2.770	7.413	-63%
TOTAL GENERAL	18.555	34.668	-47%

(1) Y compris les volailles mortes.

*Source: SEDES, 1969, p. 130.

Table 18

Meat Supply in Ghana*

	1960	1966	variation
- production locale	17.000 tonnes	25.000 tonnes	+ 47 %
- importations	35.000 tonnes	18.000 tonnes	- 49 %
- disponible global	52.000 tonnes	43.000 tonnes	- 17 %

*Source: SEDES, 1969, p. 140.

Table 19

Meat Consumption in Ghana*

PRODUITS	Disponibilités globales (tonnes)		Consommation individuelle (kg par an) (1)		Variations de la consommation individuelle en %
	1960	1966	1960	1966	
Viande et abats bovins	28.750	20.250	4,2	2,6	- 38%
Viande et abats ovins-caprins	8.970	8.029	1,3	1,0	- 23%
Viande et abats porcins	1.925	4.160	0,3	0,5	+ 66%
Viande foraine importée	1.370	824	0,2	0,1	- 50%
Total viande et abats	41.015	33.346	6,0	4,2	- 30%
Volailles	3.200	7.394	0,5	1,0	+ 100%
Conserves de viande	7.413	2.770 (2)	1,1	0,3	- 73%
Poisson (3)	95.400	115.600	14,1	15,5	+ 10%
Gibier et produits de cueillette (4)		27.000		3,5	

(1) Les chiffres retenus pour la population totale sont de 6.777.000 habitants en 1960 et 7.950.000 habitants en 1966.

(2) On pourra rajouter une centaine de tonnes fabriquées à Bolgatanga.

(3) Selon LAGOIN et SALMON, ouvrage déjà cité, les données concernent les années 1960 et 1964.

(4) D'après KASSEM "in Ghana - Animal Husbandry, Production and Health".

*Source: SEDES, 1969, p. 140.

32

Table 20

Controlled Slaughter in Large Ghana Towns

ANNEES	Nombre d'animaux abattus (en milliers)		
	Bovins	Ovins-Caprins	Porcins
1961	42,6	56,8	14,0
1962	48,5	71,1	15,4
1963	53,5	85,8	14,8
1964	63,2	93,7	16,0
1965	41,2	58,2	16,2
1966	39,6	51,0	12,9

*Source: SEDES, 1969, p. 141.

Table 21

Togolese Meat Imports*

Unité: tonne de carcasse et d'abats

PRODUITS		1966 (tonnes)	1962 (tonnes)	Variations par rapport à 1962 en %
Bétail importé vivant:				
- Bovins	carcasse	1.550	1.230	
	abats	390	310	
	TOTAL	1.940	1.540	+ 26%
- Ovins-Caprins	carcasse	170	150	
	abats	25	20	
	TOTAL	195	170	+ 15%
Total bétail vivant:				
	carcasse	1.720	1.380	
	abats	415	330	
	TOTAL	2.135	1.710	+ 25%
Viande foraine		25	64	- 61%
Conserves et charcuterie		136	127	+ 7%
TOTAL GENERAL		2.296	1.901	+ 21%

*Source: SEDES, 1969, p. 158.

Table 22

Meat Consumption in Togo*

PRODUITS	Disponibilités globales (en tonnes)		Consommation individuelle (en kg par an) (1)		Variations de la consom- mation individuelle en %
	1962	1966	1962	1966	
Viande et abats bovins	3.200	4.015	2,1	2,4	+ 14%
Viande et abats ovins-caprins	2.000	4.335	1,3	2,6	+ 100%
Viande et abats porcins	2.200	3.036	1,5	1,8	+ 20%
Viande foraine importée	50	25	-	-	-
Total viande et abats	7.450	11.411	4,9	6,8	+ 38%
Volailles	2.500	3.000	1,7	1,8	+ 6%
Conserves de viande	127	136	0,1	0,1	-
Poisson équivalent frais (2)	12.100	21.300	7,8	12,5	+ 60%
Gibier (3)		3.200		2,0	

(1) Les chiffres retenus pour la population totale sont de 1.500.000 habitants en 1962 et de 1.660.000 habitants en 1966.

(2) Les données sur le poisson sont extraites du rapport de M. BERNARD: Perspectives des Pêches Maritimes au Togo - Secrétariat aux Affaires Etrangères - Sect. coopération, Paris 1969 - elles concernent les années 1963 et 1967 -

(3) Estimation faite par conversion en volume des données contenues dans les comptes économiques du Togo, concerne l'année 1966.

*Sources: SEDES, 1969, p. 160.

When Do Herders Sell?

The sharp seasonality of rainfall in the Sahel gives rise to sharp fluctuations in the weight and price of animals, and in the supply and price of grain. Hence the timing of herder sales is critical. Several observers have noted the seasonal variations in livestock sales (see, for example, Frechou, 1966; Vincent, ; Hill, 1966; Gallais, 1967; and Dupire, 1962 and 1965), and Dupire (1965, pp. 124-125) has remarked on their unfavorable nature for Fulani in Niger:

How is the commercial behavior of the Bororo adapted to these seasonal variations which, although indeed influenced by many secondary factors, nevertheless remain predictable in their main outline? The Wodaabe sell their cattle primarily in March-April, in order to pay tax, when the price is already very low and their animals are particularly skinny. Some of them also trade in July before going off to wet season transhumance, in order to buy clothes and salt: the price at this period is only slightly higher. It is when they no longer have enough milk to exchange for millet that they buy millet -- at the end of the dry season when the price of millet is already half way up the rising curve. We may say that this is very bad calculation, but it is not due to ignorance, for they are perfectly well aware that they get none of the benefit of the changes in price.

It is, in fact, actually impossible for them, for diverse ecological and cultural reasons, to behave more gainfully.

The available data confirm the sharp seasonality of cattle sales, but do not reveal a pattern that is to the herders' disadvantage. Figures on slaughter, exports and imports, in the Sahelian and coastal countries generally show increases from around September/October to yearly peaks in December/January, falling off in February/March (sometimes having small peaks in April) and reaching a minimum in June/July.¹ Tables 1 to 6 report some recent monthly indices for Mali and Upper Volta, Staatz (1975, 1976) reports monthly data for Ghana

¹We would expect sales by herders to occur about one month before the animals are recorded in Sahelian export and slaughter data, owing to collection time by merchants. Slaughter at coastal cities would occur at least one additional month later.

and Nigeria, and SEDES (1969, p. 36) summarizes the situation in Niger as follows:

"La variation saisonnière de fréquentation des marchés est bien connue du Niger. La période active se situe de novembre à mai un maximum vers décembre et janvier... La période de baisse dure de juin à octobre, avec un minimum en juin-juillet."

As indicated above, the seasonality in livestock marketing has its analog in several other relevant patterns. Rainfall in the Sahel generally starts in May and ends in September/October. During this period herds are in their northern pastures gaining weight. The months of peak sales thus occur after the rains, as the herds are moving south to dry season pasture, while the animals are heavy and healthy. This tends to maximize meat supply per animal and to provide a maximum number of healthy, exportable animals able to make the long, hard trip south.

In the Sahel the major grain crops (sorghum and millet) are harvested between October and December. Hence grain prices reach a peak between July and September, and a nadir between November and January. This pattern would be beneficial to herders if they purchased grain soon after selling animals, but Dupire indicates that they delay until prices have risen. In any event, the seasonality of animal sales does not put the herders at a disadvantage regarding grain purchases. In fact Becker (1974, pp. 41-43) makes the opposite point. He notes that herders buy grain soon after the harvest and thus take advantage of low prices, even in poor crop years because production shortfalls do not seem to be reflected in unusually higher prices until several months after the harvest.

We have not yet located adequate monthly data on meat and animal prices that might reveal clear seasonal patterns. The three brief meat price series from Ouagadougou in Table 7 show higher prices mainly between April and August, which may be attributable to lower supply since this is the time of low sales when animals are in their northern pastures. However, we would also expect

higher prices for export animals between September and December, when merchants are forming convoys for the trip south.

The seasonal availability of transport also probably plays a role in animal prices and supply. During the rainy season it is difficult, if not impossible, to truck or trek animals to the coast or to the southern parts of the Sahel. Thus effective demand would be lowered. If herders would sell more animals during this season, the transport bottleneck might be circumvented if enough railway cars were available. Many sources cite the general inadequacies of rail transport, but this may refer mainly to the period after crop harvests when livestock may have to compete with cotton and groundnuts for train space. A more detailed examination of this and related issues will be made in the transportation section.

In summary the available data confirm sharp seasonality in livestock sales with the major peak near the end of the year and the deepest trough in the middle of the year. This pattern has certain advantages for maximizing the supply of meat to consumers. The herders are not placed in a disadvantaged position relative to grain prices and availability, if they take advantage of their opportunities. The interactions of the livestock sales pattern with meat and animal prices and with rail transport are not yet very clear.

Table 1

Recorded Cattle Exports in Mali, 1972-73, By Region*
(Monthly Indices of Number of Head)

Months→	January	February	March	April	May	June	July	August	September	October	November	December
Bamako												
1972	127	125	129	37	45	74	56	64	--	119	142	182
1973	147	--	174	5	10	46	41	49	101	373	--	53
Kayes												
1972	--	--	119	--	81	--	--	--	--	--	--	--
1973	112	143	--	37	110	11	--	--	--	170	--	117
Sikasso												
1972	97	59	37	92	73	39	94	81	137	246	133	113
1973	79	115	82	74	89	135	72	37	131	115	68	203
Segou												
1972	48	108	84	115	56	70	88	63	63	156	188	162
1973	114	100	111	81	99	46	61	54	136	166	124	108
Mopti												
1972	73	61	133	132	112	86	96	104	129	58	59	158
1973	64	113	114	150	116	107	48	59	113	95	98	124
Gao												
1972	150	141	152	122	114	122	44	101	78	24	44	107
1973	121	148	128	100	99	18	--	1	111	64	109	201
Total												
1972	93	97	120	107	87	83	79	86	84	103	108	153
1973	106	101	123	93	93	77	49	47	121	172	85	134

*Calculated from data in: Mali, Bulletin Mensuel de Statistique, various issues.

Table 2

Recorded Cattle Slaughter in Mali, 1972-73, By Region*
(Monthly Indices of Number of Head)

Months →	January	February	March	April	May	June	July	August	September	October	November	December
Bamako												
1972	87	67	56	67	74	106	74	77	155	133	131	172
1973	216	13	25	166	14	146	21	22	15	39	29	493
Kayes												
1972	111	103	109	102	75	69	100	94	99	116	126	96
1973	94	87	104	102	120	96	107	114	102	112	43	118
Sikasso												
1972	95	87	83	78	90	83	104	106	115	124	119	116
1973	99	101	105	56	89	84	104	103	108	123	94	134
Segou												
1972	101	97	108	98	84	62	78	105	110	107	120	130
1973	42	76	88	91	93	273	22	76	96	119	111	114
Mopti												
1972	107	96	111	91	101	74	62	82	88	103	128	157
1973	81	101	136	99	92	88	81	111	83	122	96	110
Gao												
1972	134	107	134	113	90	51	40	45	80	139	103	165
1973	106	135	164	155	154	123	67	37	39	55	77	87
Total												
1972	97	83	81	81	80	87	78	83	128	125	126	150
1973	152	54	69	133	61	141	48	56	51	73	54	309

*Calculated from data in: Mali, Bulletin Mensuel de Statistique, various issues.

37

Table 3

Recorded Sheep - Goats Exports in Mali, 1972-1973, by Region*
(Monthly Indices of Number of Head)

Months →	January	February	March	April	May	June	July	August	September	October	November	December
Bamako												
1972	471	100	82	91	27	69	54	59	--	84	53	101
1973	275	--	54	8	--	14	30	13	29	66	--	409
Kayes												
1972	--	--	--	--	105	--	--	95	--	--	--	--
1973	7	--	--	--	--	--	--	--	--	--	--	193
Sikasso												
1972	129	15	32	93	46	0	43	46	18	41	19	725
1973	115	107	76	94	152	75	76	73	117	3	--	213
Segou												
1972	140	89	122	97	106	47	52	54	47	219	41	186
1973	160	103	55	74	49	87	108	43	52	51	44	374
Mopti												
1972	143	67	93	143	95	112	93	97	63	36	104	155
1973	90	60	55	88	96	93	120	3	117	141	123	216
Gao												
1972	223	135	221	105	31	0	151	70	24	12	31	198
1973	518	92	109	62	4	--	--	--	1	96	15	3
Total												
1972	187	79	107	119	84	73	79	78	45	89	70	190
1973	178	71	62	74	65	76	99	20	80	101	74	300

*Calculated from data in: Mali, Bulletin Mensuel de Statistique, various issues.

Table 4

Recorded Sheep-Goats Slaughter in Mali, 1972-73, By Region*
(Monthly Indices of Number of Head)

Months →	January	February	March	April	May	June	July	August	September	October	November	December
Bamako												
1972	58	69	99	107	113	75	92	12	164	111	91	114
1973	100	40	47	106	64	195	81	52	31	34	33	417
Kayes												
1972	88	98	135	125	103	122	163	94	73	68	73	58
1973	87	95	114	118	142	193	133	120	68	41	5	85
Sikasso												
1972	78	78	108	127	142	112	136	96	100	84	73	65
1973	59	80	89	106	129	129	124	135	105	87	34	122
Segou												
1972	70	29	77	97	87	140	229	170	86	64	67	82
1973	53	85	97	128	161	158	104	180	66	75	15	79
Mopti												
1972	73	84	99	113	113	93	134	131	110	84	84	82
1973	69	92	118	94	108	110	123	133	94	108	73	79
Gao												
1972	74	59	82	80	99	94	96	136	131	131	97	122
1973	58	62	181	90	98	83	105	129	117	118	86	75
Total												
1972	71	62	94	105	108	106	146	110	122	96	84	98
1973	70	70	105	107	122	143	105	124	76	79	44	164

*Calculated from data in: Mali, Bulletin Mensuel de Statistique, various issues.

Table 5

Recorded Exports From Upper Volta*
(Monthly Indices of Metric Ton Equivalents)

Item and Year	January	February	March	April	May	June	July	August	September	October	November	December
Live Animals												
1970	15	39	54	75	83	89	105	119	129	146	160	186
1971	14	35	49	62	71	80	91	109	126	154	183	225
Cattle												
1970	19	34	54	75	83	87	100	111	125	146	165	196
1971	12	27	41	52	60	69	80	101	126	167	209	256
Goats and Sheep												
1970	13	41	58	80	89	100	112	122	127	141	148	170
1971	20	52	64	75	86	95	104	115	124	135	153	179

*Calculated from Upper Volta, Bulletin Mensuel d'Information Statistique et Economique, various issues.

Table 6

Recorded Imports to Upper Volta*
(Monthly Indices of Metric Ton Equivalents)

Item and Year	January	February	March	April	May	June	July	August	September	October	November	December
Live animals												
1970	8	22	31	42	62	72	78	98	137	176	221	253
1971	17	32	52	63	71	84	93	103	128	153	186	217
1972	16	19	44	61	81	92	103	116	124	155	177	211
Cattle												
1970	6	16	24	34	56	65	71	93	140	186	237	273
1971	16	30	49	60	68	82	91	101	129	156	192	224
1972	14	17	41	61	81	92	104	117	124	159	180	211
Goats and sheep												
1970	16	51	62	79	92	100	108	116	127	132	147	170
1971	27	51	68	82	93	99	107	112	120	131	145	166
1972	14	18	36	50	62	122	127	132	140	146	229	125

*Calculated from data in: Upper Volta, Bulletin Mensuel d'Information Statistique et Economique, various issues.

Table 7

Prices on the Central Market in Ouagadougou, Upper Volta*
(Monthly Indices)

Item and Year	January	February	March	April	May	June	July	August	September	October	November	December
Beef with bone												
1970	107	95	86	107	113	122	111	102	84	88	84	102
1971	87	73	65	65	100	114	121	107	124	88	102	154
1972	99	69	78	98	124	107	122	135	97	90	94	88
Mutton with bone												
1970	118	116	110	88	113	99	108	114	82	94	82	77
1971	78	63	88	65	124	122	138	90	92	84	133	122
1972	60	60	74	76	62	74	68	70	67	65	58	472

*Calculated from data in : Upper Volta, Bulletin Mensuel d'Information Statistique et Economique, various issues

How Are Herders Linked to the Marketing Chain?

The following marketing agents have been identified by numerous observers of the Central-West African livestock trade: 1) dillali or brokers between herders and merchants; (2) coxers or bush collectors; (3) small merchants operating domestically; (4) large merchants operating internationally; (5) shepherds and convoy chiefs; (6) courtiers or brokers between merchants and butchers in southern markets; (7) logeurs or large scale courtiers; (8) wholesale and retail butchers.

Herders are linked primarily to the first three types of agents listed. Their sales occur at market places and in the bush. When herders come to sell at a market place they often avail themselves of "their" dillali's services, which SEDES (1969, p. 37) summarizes as follows:

"to lodge and feed the seller at the market, to serve as interpreter, to search for a buyer, to negotiate the price. For the seller, moreover, he provides a guarantee of receiving a fair price; for the buyer he provides a guarantee against the risks that the animal has been stolen." [translation by the author].

As compensation for these services the dillali receives a commission from the buyer. For large cattle this ranges from 100 CFAF per animal in southern markets where the buyers' risks are lower, to 500 CFAF in the north where those risks are greater (SEDES, 1969, p. 37).

On the seller's (herder's) side, the dillali relationship is more complex, as explained by Dupire (1965, p. 112-113):

"This economic role has social aspects, and the particular relationship which joins the Bororo with their dillalai takes the form of a "social contract." Those to whom the Bororo of the Tahoua region turn belong to the category dillalai-mahautaa or middlemen-butchers. Normally they do not succeed in becoming independent traders (dioula), as do certain middlemen of the superior category who buy in the dry and cold seasons at important markets in the interior in order to resell in Nigeria. Some of these say they are the descendants of captives who belonged to Fulani or Bororo families now in Niger ... But if their ancestors were of the butcher caste among the Fulani, today they do not practice this profession and limit themselves to buying and selling. They constitute one of the numerous branches reckoned among the profession of butcher in Hausa society.

"These dillalai-mahautaa, although they are today free, continue to observe towards the descendants of their former masters certain of the obligations under which their ancestors lay...Among the Bororo, servile relations have become very much lessened in content and have actually been assimilated into a sort of joking relationship (dendiragaal).

"The dillali gives food and lodging to "his Bororo" when the latter comes to do business in the village; the latter (the Bororo) receives him in his camp, giving him, from time to time, the gift of a cow (in the dendiragaal relationship the gifts given by the superior to the inferior are always the greater). In addition, the dillali-mahaucii takes orders for his Bororo clients and brings the goods they need to them in the bush. Both of them indulge in verbal joking, and the "slave" is entitled, like the sister's son, to "rob" his "master" of a head of cattle to sell for his own profit: a simple simulacrum implying restoration under one form or another. No motive for disagreement, say the dillalai-mahautaa, can arise between them and "their Bororos."

"This relationship is fitted into the ancient feudal structure of the Fulani states. Bonds of vassalage and of clientage in Fouta-Jalon tied families of the patron conquerors to the original holders of the land, to those who immigrated after the conquest, to scholars and marabout strangers, to certain specialist artisans (butchers and shoemakers) and to traders. Since even the sedentary Fulani have always avoided the activities of the artisan and the trader, they need middlemen."

Even though the Bororo case described above indicates a close social relationship, Dupire (1965, p. 111) notes that a dillali may cheat his herder client by reporting less than the true sale price, thereby improving the three to five percent commission. According to Dupire (1965, p. 111) the dillali are quite mobile, accompanying their herder clients to several markets and also serving as brokers in the bush, away from market places.

There seem to be two types of "bush" sales. One is to a "coxer" who is employed by a merchant and scours the bush for purchases on his merchant's account (Société Ivoirienne de Gestion d'Etudes et de Services, 1972, p. 3). Another is probably to the small merchant who moves a short distance from a market place to intercept herders on their way in. This latter type of bush sale is much closer to a market place sale in the extent to which it is subject to competitive forces.

The literature contains two diametrically opposite reports on the terms of herder sales. According to SEDES (1969, p. 272) these sales are invariably for cash:

"Il est remarquable de constater que ce paiement au comptant [to the producer] est devenu absolument général, quelle que soit la longueur ou l'importance du circuit.... Il en résulte, que le marchand doit être un véritable banquier s'il veut faire des convois importantes et qu'il a intérêt à accélérer au maximum la rotation de son capital."

This view is also found in Stryker (1975, p. 9) and SIGES (1972, p. 16), although both may be relying on SEDES reports.

In contrast to the above, two anthropologists report that herder sales are primarily on credit. Rupp (1975, p. 53) notes "the importance of credit, which is the most frequent form of purchase," in the Nara-Niono plain of Mali. She also states that "most of Dilly's merchants are in debt either to the graziers who supply them with animals or to livestock traders", (Rupp, 1975, p. 122). In Niger Dupire (1965, pp. 111-112) reports that "the sale is generally on credit (the buyer at the conclusion of the bargain paying down only a third of the agreed price), [and] it is to 'his dillali' that the Bororo seller turns if he has not recovered his payment."

These sharply differing reports on a critical element of the livestock trade are puzzling. It may be that there are credit sales but for a relatively short term, although Rupp's comments on merchants' chronic indebtedness to herders seems to indicate longer term debts. Field research studies under this project will look into the terms of herder sales in an effort to resolve this contradiction.

As indicated above, one of the dillali's important services is to guarantee a fair price for his herder client. In effect the dillali is an information broker who is knowledgeable about market prices, among other things. Thus the dillali supplements word-of-mouth information among herders. Vincent

,p.152) seems to imply that herders have good market knowledge and the will to use it when he notes that in Mali the Peul is patient and will hold out for a good price or take his animals to other markets. There are similar reports for Niger. Dupire (1965,p.122) notes that the Bororo are aware of local price differentials and often succeed in taking advantage of them.

Additional light may be shed on the adequacy of herders' information by comparing prices at relevant markets. The best comparisons would be for nearby bush markets that are supplied primarily by herders. If prices at such markets were not close together there would be reason to doubt either the adequacy of information or herders desire/ability to utilize it, or both. Such data are not now available to us but shall be sought during Phase B of the project.

We were able to compare 10 average annual prices for the Maradi and Zinder circonscriptions in Niger, and also 10 three-month averages for those two areas. The data are presented in Table 1. These data fall short of the aforementioned ideal because, although both are at about the same latitude and are supplied by many herders, they are also supplied by many small merchants selling to larger merchants who are assembling large convoys to send south. We would expect the presence of so many merchants to result in good spatial arbitrage and hence nearly equal prices in these two areas whose main market towns are about 130 miles apart.

The data do not confirm this expectation. The ten annual averages differ by 18.2% on average, while the average difference between the two sets of ten three-month prices is 28.0%. These seem like large differences for such a small distance between two similar, large marketing areas. (Zinder sees a greater number of cattle marketed each year.) One might also be unsettled to note that in eight of the twenty time periods the Maradi price was higher

Table 1Average Prices in the Circonscriptions of Maradi and Zinder*

	<u>Maradi</u> (CFAF per head)	<u>Zinder</u> (CFAF per head)	<u>Absolute</u> <u>Difference</u> (CFAF)	<u>Percent</u> <u>Difference</u>
1963 Annual Average				
Boeuf gras export (BGE)	15,541	12,500	3,041	24.3%
Boeuf six ans (BSA)	13,708	9,416	4,292	45.6%
1964 First Trimester Average				
BGE	13,900	12,000	1,900	15.8
BSA	11,000	9,000	2,000	22.2
1966 Annual Average				
BGE	12,162	14,499	2,337	19.2
BSA	10,583	10,541	42	0.4
1967 First Trimester Average				
BGE	12,333	15,000	2,667	21.6
BSA	8,833	11,000	2,167	24.5
1967 Annual Average				
BGE	13,666	15,000	1,334	9.8
BSA	10,875	9,300	1,575	16.9
1968 Third Trimester Average				
BGE	12,000	12,000	0	0
BSA	10,000	8,000	2,000	25.0
1969 Annual Average				
BGE	12,979	11,312	1,667	14.7
BSA	10,124	9,437	687	7.2
1970 Third Trimester Average				
BGE	12,333	15,000	2,667	21.6
BSA	10,000	17,000	7,000	70.0
1971 Annual Average				
BGE	16,646	20,305	3,659	22.0
BSA	11,639	14,205	2,566	22.0
1972 Third Trimester Average				
BGE	24,333	30,000	5,667	23.3
BSA	16,067	25,000	8,933	55.6

*Source: Service de l'Elevage, Niger.

while in ten the Zinder was higher. (Twice the price was virtually equal.) The question of spatial arbitrage will be addressed in the Upper Voltan marketing field study and we shall attempt to obtain more price data in order to perform analyses similar to the above for different types of markets.

How Profitable is the Long Distance Cattle Trade?

We have been able to locate four studies that present "representative" costs and returns in the cattle trade along 21 different routes (SEDES, 1969; SEDES, 1973; Bishop, 1972; The P.E. Management Group, 1960)¹. Analysis of these data faces all the dangers usually associated with averages, but such analysis may provide a useful starting point for more detailed work with information provided by the field studies. Of primary interest is the return earned on the investment made by the long distance trader (grand marchand). Subsequent more detailed studies should examine the balance sheets of other critical intermediaries in the marketing chain.

SEDES has categorized trading costs as follows for one route:

1. Purchase price
2. Cost of collecting animals for a convoy
 - a. collectors' salaries
 - b. brokers' commission
3. Cost of transporting animal south
 - a. shepherds' salaries
 - b. shepherds' maintenance
 - c. loss from forced sale en route
 - d. incidental costs and damages
 - e. cost of modern transport (if used)
 - f. cost of shepherds' return trip
4. General Costs
 - a. health taxes
 - b. customs taxes
 - c. license fees
 - d. financial costs
 - e. convoy chief's salary
 - f. merchants' travel (if any)
5. Selling costs
 - a. brokers' fees²
 - b. shepherds' maintenance
 - c. credit costs

¹Data from the P.E. Management Group are analyzed in Staatz, January, 1976, pp. 92-93.

²Some sources (Cohen, 1969; Hill, 1966) state that purchasers, not sellers, pay this commission.

Two of the above items must be examined closely: customs taxes and financial costs. Estimates of international cattle smuggling usually range from 50% to 80% of the total number of animals exported in this area. Thus most traders avoid customs taxes. Investment funds for buying cattle usually come from traders' own resources. Thus traders do not pay interest but rather forego other opportunities to use those funds. One way to measure the trade's relative profitability is to compare the return on funds used in the trade with returns from alternate uses of funds. In such a comparison returns from trading should not be decreased by the opportunity cost of the funds (with which the trading returns are to be compared) since this would be a form of double counting.

Some earlier studies seem to have overlooked the above points and also one additional consideration. Many, if not most, traders are said to launch between two and eight convoys a year. Much of the literature indicates that at least two or three convoys each year are launched with the same funds. That is, large traders rotate their funds several times per year. Thus, for example a 10 per cent profit per convoy may imply a 30 per cent return per year.¹ Indeed, one of the problems cited in the literature (Cohen, 1969; Hill, 1966), is the delay traders face in recovering their earnings, thereby decreasing the number of times they can rotate their funds.

Finally, one can view profits as either a per cent of the trader's investment or as a per cent of the final sales price.² The latter analysis is stressed by SEDES (1973) and Stryker (1975), while we prefer the former

¹If \$100 earns \$10 three times in a year, the yearly earning is \$30 or 30 per cent; or more with compounding.

²The two alternatives can yield different results. For example, an outlay of 20,000 CFAF for the purchase and marketing of an animal and a sales price of 30,000 CFAF indicate 50 per cent or 33 1/3 per cent profitability, depending on which base is used.

since our goal is to determine the relative profitability of cattle trading as opposed to other uses of investment funds. Such a comparison may provide evidence as to whether long distance cattle trading yields relatively large profits that are maintained because of barriers to entry, for example. If alternative investments yield significantly lower returns, one would have expected that other investors would divert their funds to the cattle trade and hence perhaps drive down profits.

Table 1 shows the rate of return on funds invested in cattle trading along 20 routes, the details for which are presented in Tables 4 to 16. Column 4 in Table 1 shows the total costs (purchase price of the animal and all marketing costs) as reported in the original sources. Column 5 shows those costs minus customs duties and the opportunity cost of capital, in accord with the above discussion. Columns 6 and 7 show profit as a per cent of costs in columns 4 and 5, respectively (sales price of the animal minus the relevant cost, divided by that cost).

As argued above, column 7 presents the relevant rate of return for use in a comparison of the profitability of long distance cattle trade relative to other investment opportunities. SEDES (1969,1973) states that 20 per cent per year is the relevant opportunity cost for funds used in the trade.¹

In a perfectly competitive situation we would expect the rate of return in cattle trading to be insignificantly greater than that opportunity cost. This expectation is not borne out in Table 1 when we consider the rotation of funds.

The data in Table 1 apply to only one convoy. As discussed above, most merchants launch at least two convoys per year, depending on the duration of

¹"Le taux d'intérêt représentant l'immobilisation du capital qui empêche le marchand de faire une autre opération, peut-être évalué à 20% par an..." (SEDES, 1969, p. 302).

Table 1

Costs and Returns to the Cattle Trade Along Twenty Routes*

Route	(1) Duration (days)	(2) Distance (Km.)	(3) Number of Animals	(4) Total Cost (FCFA/head)	(5) Cost Less Customs and Finance Charges (FCFA/head)	(6) Profit Based on (4) (%)	(7) Profit Bas on (5) (%)
1. Adel Bagrou - Segou - Ferkessedougou- Abidjan	100-110	1,600	80	24,495	21,620	14.3	29.5
2. Adel Bagrou - Bamako - Abidjan	60-90	1,500	40	30,860	28,585	9.6	18.3
3. Niono - Bamako	50	300	50	18,160	17,460	0.2	4.2
4. Nara - Kati	20-40	370	50	16,730	16,030	0.9	5.3
5. Sevare - Abidjan	60-100	1,250	50	29,280	24,630	5.9	25.9
6. Niono-Abidjan	90-100	1,250	50	28,970	23,920	3.6	25.4
7. Mopti-Bobo Dioulasso	70-80	450	50	23,315	19,725	-6.7	10.3
8. Mopti-Paga	60-70	600	50	27,900	21,550	-3.2	25.3
9. Gao-Bawku	60-75	700	50	26,700	20,350	1.1	32.1
10. Kati-Monrovia	20	1,400	20	37,055	32,305	4.6	20.0
11. Mopti-Bobo Dioulasso- Abidjan	140	1,330	150	26,850	22,250	0.6	21.4
12. Gao-Kumasi	80		150	27,900	22,200	1.8	27.9
13. San-Bouaké	120		50	21,900	18,500	5.0	24.3
14. Bobo Dioulasso-Abidjan	120		50	23,500	20,650	6.4	21.1
15. Tahoua-Ibadan	80		60	21,000	18,660	6.0	20.6

*Based on Tables 4 to 19.

Table 1 continued:

Route	(1) Duration (days)	(2) Distance (Km.)	(3) Number of Animals	(4) Total Cost (FCFA/head)	(5) Cost Less Customs and Finance Charges (FCFA/head)	(6) Profit Based on (4) (%)	(7) Profit Base on (5) (%)
16. N'Guru-Lagos	60		30	21,400	20,240	7.4	13.6
17. Markoye-Abidjan		1,600		36,940	32,320	8.3	23.8
18. Markoye-Lome		1,250		32,310	27,110	8.3	29.1
19. Ayorou-Cotonou		1,400		36,320	32,320	10.1	23.8
20. Gotheye-Lome		1,400		31,845	27,845	9.9	25.7

Notes:

Routes 1 - 16: Taxes subtracted were labelled "Taxes de douane." We did not distinguish export and import taxes
 Routes 17 - 20: Taxes subtracted are only export taxes. Import taxes are reported separately for routes 18 and 20, but these were not deducted since we do not know the extent to which they are avoided.

69

each. This rotation of funds means we must double the rate of return for the lengthier convoys, and more than double the returns for shorter ones. Table 2 shows the rates of return possible if traders rotated their funds as fast as possible given the convoy's (mean) duration plus 20 per cent of that time as slack.¹ The average of those potential returns is 84.7%, their range is from 25.2% to 320.8%², and only one is less than 40 per cent. Obviously, these potential rates of return are considerably above a 20 per cent opportunity cost for investable funds.

Before concluding that there are excessive profits in the long distance cattle trade, several questions must be raised. First, does the 20 per cent opportunity cost include an implicit wage for the trader's managerial input? If not, then the opportunity cost should be compared not with the figures shown in Tables 1 and 2, but with rates calculated after a managerial wage is deducted from trading returns. However, we would hypothesize that the 20 per cent opportunity cost does contain a managerial wage. It obviously would if the opportunity foregone was another venture that the trader would manage. It also would contain such a wage if the trader lent the money to farmers or small entrepreneurs. The literature on informal credit in developing nations stresses the high costs of information and collection borne by lenders. That is, informal lenders can not simply lend money to any applicant and sit back awaiting repayment.

Second, we must ask whether traders actually do rotate their funds (launch convoys) as often as is indicated in Table 2. This is an empirical question

¹The table only considers those sixteen routes for which the duration is given.

²The figure of 320.8% is based on a 20 day convoy repeated 16 times. This is the only route for which more than 10 rotations were assumed. For 14 of the 16 routes there were 6 or fewer rotations assumed. If the 320.8% figure and the 25.3% figure are both excluded, the average potential rate of return is 72.2% and the range is from 41.2% to 130.8%.

Table 2

Potential Annual Rates of Return in Cattle Trading

<u>Route</u>	<u>Potential Rotation</u>	<u>Potential Annual Rate of Return</u>
1	2	59.0%
2	4	73.2
3	6	25.2
4	10	53.0
5	4	103.6
6	3	76.2
7	4	41.2
8	5	126.5
9	4	130.8
10	16	320.0
11	2	42.8
12	3	83.7
13	2	48.6
14	2	42.2
15	3	61.8
16	5	68.0

on which we have very little information. SEDES (1969) states that a trader working one of the lengthier routes will launch two convoys while on routes of less duration they may launch four:

"En pratique, les rotations ne se suivent jamais sans interruption. En effet, si un marchand met 120 jours pour effectuer une rotation vers la Côte d'Ivoire, il ne fera jamais 3 circuits par an, mais un long et un petit, au maximum 2 longs, consacrant le reste de son temps à la culture, au repos ou à la commercialisation de produits ramenés de la Côte (noix de cola).

Vers le Ghana, les profits escomptés rendent l'activité plus soutenue, mais si une rotation dure 60 jours, il y en aura grand maximum 4 par an." (SEDES, 1969, p. 305).

The marketing field studies should provide more detailed information on this issue.

The third and perhaps most important question is whether 20 per cent does in fact represent the opportunity cost of capital. We have no reliable information on this matter and again must look to the field studies for answers.

Although the available data are too rough and scanty to support much comparative analysis of different routes, a few patterns seem to be discernable. If traders rotate their funds as indicated in Table 2, then there appears to be a rough correlation between rate of return and possible rotations. Convoys permitting two rotations had an average rate of return of 48.2 per cent, those permitting three rotations had an average of 73.9 per cent, those permitting four had an average of 87.2 per cent, and those permitting five had an average of 97.2 per cent. (There is one observation for each of six, ten, and sixteen rotations with returns of 25.2, 53.0, and 320.0 per cent, respectively. See discussion below of the first two, which are exceptions to the general correlation.)

The rough correlation between brevity of the venture and rate of return seems to indicate that delays arising from slow payment by butchers in the

south and by inadequate transportation should be investigated. With regard to transportation, a comparison of routes 1 and 11 with routes 2 and 5 is interesting. Table 3 shows their distances, durations, potential rotations, potential rates of return and expenditures on modern transportation. The comparison seems to indicate the importance of modern transport in the trade.

Truck shipments may increase profitability by avoiding the commonly cited delays of loading at railheads. The two means of transport also have different impacts on weight loss per animal, and losses from forced sales en route will be partially determined by the portion of the trip made on foot before loading onto a train or truck.¹ The convoys using trucks seem to have suffered less weight loss, but the main difference between the two pairs of convoys is their duration. The truck convoys covered the same distances quicker and hence permitted more rotations per year.²

If truck transport does yield a more profitable convoy, why do some traders use the train (or no modern transport at all)? First, there probably are not enough trucks to meet the demand and, second, truck transport is probably impossible during part of the rainy season. This second point raises the question of whether the number of potential rotations listed in Table 2 are valid. Because of constraints on modern transport, those convoys using such transport probably cannot be replicated as often as indicated. In addition, it may be difficult to obtain animals at certain times of the year. Thus, while traders may earn implicit rates of return as indicated in Table 2, they may not actually capture the full monetary profits indicated. However,

¹We do not know these proportions for the routes under study.

²We are assuming that the different durations arise mainly from different means of transport. That is we assume roughly equivalent collection times and also equivalent credit delays at the destination. Since all four routes end in Abidjan, the latter assumption, at least, seems valid.

Table 3

Comparison of the Cattle Trade on Four Routes

Route	Distance (Km.)	Duration (days)	Potential Rotations	Loss From Forced Sales En Route (FCFA/head)	Weight Loss Per Animal Sold at Destination (Kg.) (% of original wt.)	Expenditure on Modern Transport (FCFA/head)	Potential Rate of Return (%)
1	1600	100-110	2	420	20 12.5	1500	59.0
11	1330	140	2	100	10 5.6	1750	42.8
2	1500	60-90	4	360	15 8.3	5500	73.2
5	1250	60-100	4	180	5 3.1	2900	103.6

funds from a 25 per cent profit earned in just 100 days are available for other investments for 260 more days, whether or not such investments are in cattle convoys.

Two final qualifying points must be raised about the data used in this analysis. First, the information was collected in different years: routes 1 - 10 in 1970; routes 11 - 16 in 1968; and routes 16 - 20 in 1972. Depending on the stability of relative costs, returns, and other conditions over time, the accuracy of the above comparative analyses may be questioned. Second, the 20 routes shown in detail comprise two different types of ventures. Routes 3, 4, 7, 8, and 9 probably represent movements by smaller traders who are supplying large, long distance traders at the terminal markets indicated. The other routes represent movements by large traders supplying major consumption centers in the south. Even these latter should probably be differentiated according to the type of market in which they originate.

We would hypothesize that small traders who supply larger ones are "protected" by lower barriers to entry than is true for large traders. In this regard it is interesting to note that routes 3, 4, and 7, which are probably worked by small traders, sharply contradict the correlation between brevity and profitability of convoys. Those three routes show much lower potential rates of return than would be predicted by the general correlation. Furthermore, small traders probably contribute more managerial and other labor inputs per value traded than do large traders, and hence the proportion of the return that should be attributed to capital would differ between the two groups.

In summary, the available data seem to indicate that returns to long distance trading are significantly greater than the stated opportunity cost of capital. Comparative analysis of the trade along different routes seems to reveal the importance to profits of a fast rotation of funds, the role of

alternative modes of transport in the rotation, and possible different levels of profitability for different types of trade. Because the above analysis is based on relatively scanty, "representative" data, the results, (especially those stemming from the comparison of routes) should be treated as tentative. Further work during the next phase of the research and in the field studies will pursue the issues raised above in an effort to develop firmer conclusions.

Table 4

FORMATION DU PRIX DU BÉTAIL VIF SUR LE CIRCUIT ADEL RAGROU - SEGOU - FERKESSEDOUGOU - ABIDJAN *1

collecte : 30-40 j }
 trajet : 45 j } total : 100- 110 j
 vente : 30 j }

longueur : 1.600 km

	ELEMENTS DU PRIX		Coût par tête de bétail		Coût pour 80 têtes (FCFA)	Pourcentage de la valeur finale
	Unité	FCFA	Unité	Total FCFA		
ACHAT	Type d'animal : 150 kg net					
	Prix d'achat		150 x 160	16.800	1.344.000	60
FRAIS	Frais de collectage		250	250	20.000	0,9
	Frais d'acheminement :					
	Salaire des bergers	500			40.000	
	Nourriture	300			24.000	
	Pertes ventes forcées	420		3.220	33.600	11,5
	Palabres et indemnités	400			32.000	
	Passage de bac	-			-	
	Transport moderne (train)	500			120.000	
	Retour convoyeurs	100			8.000	
	Frais généraux :					
	Taxes sanitaires	500			40.000	
	Taxes douanières	75			6.000	
	Patentes	-		3.125	-	11,2
	Frais financiers	000			112.000	
	Salaire chef	300			24.000	
	Déplacements du marchand	250			20.000	
	Frais de vente :					
	Logeur	100			8.000	
	Nourriture bergers	200		1.100	16.000	3,9
	Crédit (2)	800			40.000	
	Total des frais		7.695	7.695	615.600	27,5
	Marge commerciale nette (3)		3.505	3.505	280.400	12,5
	Vente : Prix de vente (140 kg net)		200 x 140	28.000	2.240.000	100
	Marge bénéficiaire totale (1) + (2) + (3)		6.305	6.305	504.400	22,5
	Valeur ajoutée par la commercialisation :					
	- Par tête de bétail	11.200		11.200	///	40
	- Par kg net	80		80	///	

Coût du transport hors taxes : Frais 5.770 FCFA
 Perte de poids 3.000 "
 Total 9.770 " = 34,9 % de la valeur fin

Prix 175 kg → 55,8 FCFA/kg carcasse et abats
 34,9 FCFA la tonne/km

*Source: SEDES, 1973, p. 127

¹Route 1

-62-
Table 5

FORMATION DU PRIX DU BÉTAIL VIF SUR LE CIRCUIT ADEL BAGNON - BAMAKO - ABIDJAN *1

collecte : 15-21 j }
trajet : 17 j } total 60-90 j
vente : 30 j }

longueur : 1.500 km

	ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 40 têtes (FCFA)	Pourcentage de la valeur finale
		Détail FCFA	Total FCFA		
ACHAT	Type animal : 180 kg net Prix d'achat	110 x 180	19.800	792.000	58,5
FRAIS	Frais de collectage	250	250	10.000	0,7
	Frais d'acheminement :				
	Salaire des bergers	650		26.000	
	Nourriture	300		12.000	
	Pertes ventes forcées	360	7.185	14.400	21,2
	Palabres et indemnités	250		10.000	
	Passage de bac	-		-	
	Transport moderne (camion)	5.500		128.000	
	Retour convoyeurs	125		5.000	
	Frais généraux :				
	Taxe sanitaires	500		20.000	
	Taxe douanières	75		3.000	
	Patentes	-	2.525	-	7,5
	Frais financiers (1)	1.400		56.000	
	Salaire chef de convoi	300		12.000	
	Déplacements du marchand	250		10.000	
	Frais de vente :				
	Logeur	100		4.000	
	Nourriture bergers	200	1.100	8.000	3,3
	Crédit (2)	800		20.000	
	Total des frais	11.060	11.060	442.400	32,7
	Marge commerciale nette (3)	2.965	2.965	118.600	8,8
	Vente : Prix de vente (165 kg net)	205 x 165	33.825	1.353.000	100
	Marge bénéficiaire totale (1) + (2) + (3)	5.165	5.165	206.600	15,3
	Valeur ajoutée par la commercialisation :				
	- Par tête de bétail	14.025	14.025	///	
	- Par kg net	85	85	///	41,5

Coût du transport hors taxes : Frais 0.135 FCFA
Perte de poids 3.075 "
Total 12.210 " = 36,1 % de la valeur

Pour 206,2 kg → 59,2 FCFA/kg carcasse et abats
→ 39,5 FCFA la tonne/km

* Source: SEDES, 1973, p. 128

¹ Route 2.

-63-
Table 6

FORMATION DU PRIX DU BÉTAIL VIF SUR LE CIRCUIT NIONO - BAMAKO *1

collecte : 30 j
trajet : 12 j } total : 50 j
vente : 7 j

longueur : 300 km

ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 50 têtes (FCFA)	Pourcentage de la valeur finale
	Détail FCFA	Total FCFA		
ACHAT Type d'animal : 140 kg net Prix d'achat	140 x 115	16.100	805.000	88,5
FRAIS Frais de collectage	300	300	15.000	1,6
Frais d'acheminement :				
Salaire des bergers	180		9.000	
Nourriture	100		5.000	
Pertes ventes forcées	180	490	2.000	2,7
Palabres et indemnités	30		1.500	
Passage de bac	-		-	
Transport moderne	-		-	
Retour convoyeurs	-		-	
Frais généraux :				
Taxes sanitaires	-		-	
Taxes douanières	-		-	
Patentes	300	970	15.000	5,3
Frais financiers (1)	500		25.000	
Salaire chef de convoi (2)	120		6.000	
Déplacements marchand	50		2.500	
Frais de vente :				
Logeur	30		1.500	
Nourriture bergers	70	300	3.500	1,7
Crédit (3)	200		10.000	
Total des frais	2.060	2.060	103.000	11,3
Marge commerciale nette (4)	740	740	37.000	0,2
Vente : Prix de vente (135 kg net)	135 x 140	18.200	910.000	100
Marge bénéficiaire totale (1) + (2) + (3) + (4)	1.560	1.560	78.000	4,7
Valeur ajoutée par la commercialisation :				
- Par tête de bétail	2.100	2.100	///	
- Par kg net	16,2	16,2	///	11,5

Coût du transport hors taxes

Frais : 1.160 FCFA
Perte de poids 700 "
Total 1.860 " - 10,2 % de la valeur fin

Pour 162,5 kg carcasse et abats → 11,4 FCFA/kg
→ 38,2 FCFA la tonne/km

*Source: SEDES, 1973, p. 129

¹Route 3

Table 7

FORMATION DU PRIX DU BETAIL VIF SUR LE CIRCUIT NARA - KATI*1

collecte : 15-30 j }
 trajet : 12 j } total : 20-40j
 vente : 7 j }

longueur : 370 km

ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 50 têtes (FCFA)	Pourcentage de la valeur finale
	Détail FCFA	Total FCFA		
ACHAT	Type d'animal : 140 kg net Prix d'achat		105 x 140 14.700	735.000 87,1
FRAIS	Frais de collectage		200 200	10.000 1,2
	Frais d'acheminement :			
	Salaire des bergers		200	10.000
	Nourriture		100	5.000
	Pertes ventes forcées		170	8.500
Palabres et indemnités		50	2.500	
Passage de bac		-	-	
Transport moderne		-	-	
Retour convoyeurs		-	-	
Frais généraux :				
Taxes sanitaires		-	-	
Taxes douanières		-	-	
Patentes		300	15.000	
Frais financiers (1)		500	25.000	
Salaire chef de convoi (2)		150	7.500	
Déplacements marchands		60	3.000	
Frais de vente :				
Logeur		30	1.500	
Nourriture bergers		70	3.500	
Crédit (3)		200	10.000	
Total des frais		2.030	2.030	101.500 12,1
Marge commerciale nette (4)		145	145	7.250 0,9
Vente : Prix de vente (135 kg net)		125 x 135	16.875	843.750 100
Marge bénéficiaire totale (1) + (2) + (3) + (4)		995	995	49.750 5,9
Valeur ajoutée par la commercialisation :				
- Par tête de bétail		2.175	2.175	/// 12,9
- Par kg net		16,1	16,1	

Coût du transport hors taxes : Frais 1.230 FCFA
 Perte de poids 625 "
 Total 1.855 " * 11 % de la valeur finale

Pour 168,7 kg carcasse et abats 11 FCFA/kg
 29 7 FCFA la tonne/km

*Source: SEDES, 1973, p. 130

1 Route 4.

Table 8

FORMATION DU PRIX DU RETAIL VIF SUR LE CIRCUIT SEVARE - ABIDJAN *)

collecte : 20-30 j }
 trajet : 10-15 j } total : 60-100 j
 vente : 30 j }

longueur : 1.250 km

ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 50 têtes (FCFA)	Pourcentage la valeur fin
	Détail FCFA	Total FCFA		
ACHAT Type d'animal : 160 kg net Prix d'achat	160 x 115	18.400	920.000	59,4
FRAIS Frais de collectage	200	200	10.000	0,7
Frais d'acheminement : Salaire des bergers Nourriture Pertes ventes forcées Palabres et indemnités, divers Passage de bac Transport moderne (camion) Retour convoyeurs	400 150 160 200 - 2.900 150	3.960	20.000 7.500 8.000 10.000 - 145.000 7.500	12,8
Frais généraux : Taxes sanitaires Taxes douanières Patentes Frais financiers (1) Salaire chef de convoi Déplacements du marchand	150 2.250 1.500 1.600 - 120	5.620	7.500 112.500 75.000 80.000 - 6.000	18,1
Frais de vente : Logeur Nourriture bergers Crédit (2)	100 200 800	1.100	5.000 10.000 40.000	3,5
Total des frais	10.880	10.880	544.000	35,1
Marge commerciale nette (3)	1.720	1.720	86.000	5,5
Vente : Prix de vente (155 kg net)	155 x 200	31.000	1.550.000	100
Marge bénéficiaire totale (1) + (2) + (3)	4.120	4.120	206.000	13,3
Valeur ajoutée par la commercialisation : - Par tête de bétail - Par kg net	12.600 81,3	12.600 81,3	/// ///	40,6

Coût du transport hors taxe : Frais 5.560 FCFA
 Perte de poids 1.000 "
 Total 6.560 " = 21,2 % de la valeur fin

Pour 193,7 kg carcasse et abats 33,9 FCFA/kg
 = 21,7 FCFA la tonne/km

*Source: SEDES, 1973, p. 131.

Table 9

FORMATION DU PRIX DU BÉTAIL VIF SUR LE CIRCUIT NIONO - ATIDJAN *1

collecte : 30 j }
 trajet : 40-45 j } total : 90-100 j
 vente : 15 j }

longueur : 1.250 km

	ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 50 têtes (FCFA)	Pourcentage de la valeur finale
		Détail FCFA	Total FCFA		
ACHAT	Type d'animal : 160 kg net Prix d'achat	160 x 115	18.400	920.000	61,3
FRAIS	Frais de collectage (collecteur + divers)	500	500	25.000	1,7
	Frais d'acheminement :				
	Salaire des bergers	400		20.000	
	Nourriture	150		7.500	
	Pertes ventes forcées	320	2.620	16.000	8,7
	Palabres et indemnités	100		5.000	
	Passage de bac	-		-	
	Transport moderne (train)	1.500		75.000	
	Retour convoyeurs	150		7.500	
	Frais généraux :				
	Taxes sanitaires	150		7.500	
	Taxes douanières	2.250		112.500	
	Patentes	1.500	6.350	75.000	21,2
	Frais financiers (1)	2.000		100.000	
	Salaire chef de convoi	200		10.000	
	Déplacements du marchand	250		12.500	
	Frais de vente :				
	Logeur	100			
	Nourriture bergers	200	1.100	55.000	3,7
	Crédit (2)	800			
	Total des frais	10.570	10.570	528.500	35,3
	Marge commerciale nette (3)	1.030	1.030	51.500	3,4
	Vente : Prix de vente (150 kg net)	150 x 200	30.000	1.500.000	100
	Marge bénéficiaire totale (1) + (2) + (3)	3.830	3.830	191.500	12,8
	Valeur ajoutée par la commercialisation :				
	- Par tête de bétail	11.600	11.600	///	38,7
	- Par kg net	77,3	77,3	///	

Coût du transport hors taxes : Frais 4.820 FCFA
 Perte de poids 2.000 "
 Total 6.820 " = 22,7 % de la valeur finale

Pour 187,5 kg carcasse et abats = 36,4 FCFA/kg
 = 20,1 FCFA la tonne/km

*Source: SEDES, 1973, p. 132
 1 Route 6.

67
Table 10

FORMATION DU PRIX DU BETAIL VIF SUR LE CIRCUIT NOPTI - BOBODIOLASSO *1

collecte : 20-30 j }
 t-ajer : 15 j } total : 70-80j
 vente : 20 j }

longueur : 450 km

	ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 50 têtes (FCFA)	Pourcentage de la valeur final
		Détail FCFA	Total FCFA		
ACHAT	Type d'animal : 150 kg net Prix d'achat	150 x 110	16.500	825.000	75,9
FRAIS	Frais de collectage	300	300	15.000	1,4
	Frais d'acheminement : Salaire des bergers Nourriture Pertes ventes forcées Palabres et indemnités Passage de bac Transport moderne Retour convoyeurs	200 100 200 100 - - -	600	10.000 5.000 10.000 5.000 - -	2,8
	Frais généraux : Taxes sanitaires Taxes douanières Patentes Frais financiers (1) Salaire chef de convoi (2) Déplacements du marchand	300 2.490 1.500 600 150 75	5.115	15.000 124.500 75.000 30.000 7.500 3.750	23,5
	Frais de vente : Logeur Nourriture bergers Crédit (3)	100 200 500	800	5.000 10.000 25.000	3,7
	Total des frais	6.815	6.815	340.750	31,4
	Marge commerciale nette (4)	- 1.505	- 1.565	- 78.250	- 7,2
	Vente : Prix de vente (145 kg net)	145 x 150	21.750	1.087.500	100
	Marge bénéficiaire totale (1) + (2) + (3) + (4)	- 315	- 315	- 15.750	- 1,5
	Valeur ajoutée par la commercialisation : - Par tête de bétail - Par kg net	5.250 36,2	5.250 36,2	/// ///	24,1

Coût de transport hors taxes : Frais 1.425 FCFA
 Perte de poids 750 "
 Total 2.175 " * 10 % de la valeur finale

Pour 181,2 kg carcasse et abats 12 FCFA/kg
 26,7 FCFA la tonne/km

*Source: SEDES, 1973, p. 133.
 1 Route 7.

Table 11
FORMATION DU PRIX DU BETAIL VIF SUR LE CIRCUIT MOPTI - PAGA *1

{collecte : 20-30 j
trajet : 25 j total 60-70 j
vente : 10-15 j

longueur : 600 km

ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 5 têtes (FCFA)	Pourcentage la valeur
	Détail FCFA	Total FCFA		
ACHAT Type d'animal : 160 kg net Prix d'achat	160 x 115	18,400	920,000	68,1
FRAIS Frais de collectage	200	200	10,000	0,7
Frais d'acheminement :				
Salaire des bergers	300		15,000	
Nourriture	150		7,500	
Pertes ventes forcées	100		5,000	
Palabres et indemnités	150	800	7,500	3
Passage de bac	-		-	
Transport moderne	-		-	
Retour convoyeurs	100		5,000	
Frais généraux :				
Taxes sanitaires	300		15,000	
Taxes douanières	4,650		232,500	
Patentes	1,500	7,950	75,000	29,4
Frais financiers	1,300		65,000	
Salaire chef de convoi	200		10,000	
Frais de vente :				
Logeur	50		2,500	
Nourriture bergers	100	550	5,000	2,1
Crédit	400		20,000	
Total des frais	9,500	9,500	475,000	35,2
Marge commerciale nette	- 900	- 900	- 45,000	- 3,3
Vente : Prix de vente (150 kg net)	150 x 180	27,000	135,000	100
Marge bénéficiaire totale	+ 800	+ 800	+ 40,000	3
Valeur ajoutée par la commercialisation :				
- Par tête de bétail	8,600	8,600	///	31,9
- Par kg net	57,3	57,3	///	

Mali 2,250
Hte Volta 610
Ghana 1,690

Coût du transport hors taxes: Frais
Perte de poids
Total

2,300 FCFA
1,800 "
4,100 "

= 15,2 % de la valeur finale

Pour 187,5 kg carcasse et abats = 21,9 FCFA/kg
= 30,5 FCFA la

*Source: SEDES, 1973, p. 133.

Table 12

FORMATION DU PRIX DU BÉTAIL VIF SUR LE CIRCUIT GAO - BAWKU *1

collecte : 20-30 j }
 trajet : 28 j } total : 60-75 j
 vente : 10-15 j }

longueur : 700 Km

ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 50 têtes (FCFA)	Pourcentage de la valeur finale
	Détail FCFA	Total FCFA		
ACHAT Type d'animal : 160 kg net Prix d'achat	160 x 105	16.800	840.000	62,2
FRAIS Frais de collectage	300	300	15.000	1,1
Frais d'acheminement : Salaire des bergers Nourriture Pertes ventes forcées Palabres et indemnités Passage de bac Transport moderne Retour convoyeurs	400 200 200 100 50 - 100	1.050	20.000 10.000 10.000 5.000 2.500 - 5.000	
Frais généraux : Taxes sanitaires Taxes douanières Patentes Frais financiers Salaire chef de convoi	300 4.650 1.500 1.300 250	8.000	15.000 232.500 75.500 65.000 12.500	29,6
Frais de vente : Logeur Nourriture bergers Crédit	50 100 400	550	2.500 5.000 20.000	2,1
Total des frais	9.900	9.900	495.000	36,7
Marge commerciale nette	300	300	15.000	1,1
Vente : Prix de vente (150 kg net)	150 x 130	27.000	1.350.000	100
Marge bénéficiaire totale	2.000	2.000	10.000	7,4
Valeur ajoutée par la commercialisation : - Par tête de bétail - Par kg net	10.200 68	10.200 68	!!! !!!	37,8

Coût du transport hors taxes : Frais 2.600 FCFA
 Perte de poids 1.800 "
 Total 4.400 " = 16,3 % de la valeur finale

Pour 187,5 kg carcasse et abats : 23,5 FCFA/ kg
 53,5 FCFA la tonne/km

*Source: SEDES, 1973, p. 134.

¹Route 9.

Table 13

FORMATION DU PRIX DU BÉTAIL VIF SUR LE CIRCUIT KATI - MONROVIA *1

collecte : 7 j }
 trajet : 5 j } total 20 j
 vente : 7 j }

longueur : 1.400 km

ELEMENTS D	Par tête de bétail		Coût pour 20 têtes (FCFA)	Pourcentage de la valeur finale	
	FCFA	Total FCFA			
ACHAT	Type d'animal : 160 kg r Prix d'achat		20.600	416.000	53,7
FRAIS	Frais de collectage		150	3.000	0,4
	Frais d'acheminement :				
		Salairé des bergers	1.000	20.000	
		Nourriture	130	2.600	
		Pertes ventes forcées	200	4.000	
	Palabres et indemnités et divers	250	5.000	21,5	
	Passage de bac	-	-		
	Transport moderne (camion)	6.750	135.000		
	Retour convoyeurs	-	-		
	Frais généraux :				
	Taxes sanitaires	375	7.500		
	Taxes douanières ±	3.750	75.000		
	Patentes	1.500	30.000	17,9	
	Frais financiers (1)	800	16.000		
	Salairé chef de convoi	-	-		
	Déplacements du marchand	500	10.000		
	Frais de vente :				
	Logeur	100	2.000		
	Nourriture bergers	250	5.000	2,2	
	Crédit (2)	500	10.000		
	Total des frais	16.255	16.255	325.100	42
	Marge commerciale nette (3)	1.695	1.695	33.900	4,4
	Vente : Prix de vente (155 kg net)	155 x 250	38.750	775.000	100
	Marge bénéficiaire totale (1, + (2) + (3))	2.995	2.995	59.900	7,7
	Valeur ajoutée par la commercialisation :				
	- Par tête de bétail	17.950	17.950	///	
	- Par kg net	115,8	115,8	///	46,3

* Mali 2.250
 Côte d'Ivoire 500
 Libéria 1.000

Coût du transport hors taxes : Frais
 Perte de poids
 Total

9.130 FCFA
 750 " = 25,5 % de la valeur
 9.880 " finale

Pour 193,7 kg carcasse et abats = 51 FCFA/kg
 = 30,4 FCFA la tonne/km

*Source: SEDES, 1973, p. 139.
 1 Route 10.

Table 14

FORMATION DU PRIX DU BETAIL SUR LE CIRCUIT : MOPTI - BOBODIOLASSO - ABIDJAN *1

Durée : 140 jours - longueur 1.330 km

	ELEMENTS DU PRIX	Coût par tête de bétail		Coût pour 150 têtes en milliers F.CFA	Pourcentage de la valeur finale	
		Détail F.CFA	Total F.CFA			
Achat	Type d'animal : 180 kg net Prix d'achat	180 x 100	18.000	2.700	66,7	
Frais :	Frais d'achat	Collecte Logeur	150 50	200	30	0,7
	Frais d'acheminement	Soloire des bergers Nourriture Pertes Ventes forcées Palobres et indemnités Transport moderne (train)	400 200 100 50 1.750	2.500	375	9,3
	Frais généraux	Taxes de douane Autres taxes Patentes Frais financiers (1) Salaire chef convoi (2)	2.650 600 350 1.450 150	5.200	780	19,3
	Frais de vente	Logeur Crédit (3) Bergers nourriture	100 500 350	950	142	3,5
	Total des Frais		8.850	8.850	1.327	32,8
Marge commerciale	Netto (4)		150	150	23	0,5
Vente:	Prix de vente (170 kg net)		170 x 159	27.000	4.050	100,0
Marge Bénéficiaire	Totale (1) + (2) + (3) + (4)		/	2.250	338	8,3
	Valeur ajoutée par la commercialisation : - par tête de bétail		9.000	-	-	33,3
	Valeur ajoutée par kg net sur pied		53	-	-	

*Source: SEDES, 1969. p. 304.
1 Route 11.

Table 15

ANALYSE DE TROIS CIRCUITS *

		1		2		3	
ELEMENTS DU PRIX		Gao-Kumasi (80 jours)		San-bouaké (120 jours)		Bobo-Abidjan (120 jours)	
		Valeur et frais par tête	% valeur finale	Valeur et frais par tête	% valeur finale	Valeur et frais par tête	% valeur finale
Achat	Type d'animal et de convoi	180 kg net; 150 bovins		160 kg net; 50 bovins		160 kg net; 50 bovins	
	Prix de l'animal	17.500	61,6	16.000	69,6	17.000	68,0
Commercialisation	Frais d'achat et groupage	150	0,5	250	1,1	550	2,2
	Frais d'acheminement	4.000	14,1	1.200	5,2	2.300	9,2
	Frais généraux: Taxes	4.500	15,8	2.100	9,1	1.550	6,2
	Potentes	200	0,7	400	1,7	100	0,4
	Frais financiers (1)	1.100	3,9	800	3,5	700	2,8
	Salaires acheteur (2)	200	0,7	200	0,9	200	0,8
	Total	6.000	21,1	3.500	15,2	2.550	10,2
	Frais de vente: Crédit (3)	100	0,4	500	2,2	600	2,4
	Autres frais	150	0,5	450	1,9	500	2,0
	Total	250	0,9	950	4,1	1.100	4,4
Total ces frais	10.400	36,6	5.900	25,6	6.500	26,0	
Marge commerciale	Nette	500	1,8	1.100	4,8	1.500	6,0
Vente	Prix de l'animal	28.400	100	23.000	100	25.000	100
	Type d'animal et transport	170 kg net; à pied et en camion		150 kg net; à pied		160 kg net; en train	
Marge bénéficiaire totale (1) + (2) + (3) + (4)		1.900	6,7	2.600	11,3	3.000	12
Valeur ajoutée par la commercialisation ramenée au kg net sur pied		64 F.CFA/kg net sur pied		47 F.CFA/kg net sur pied		50 F.CFA/kg net sur pied	

*Source: SEDES, 1969, p. 305
1,2,3 Routes 12, 13, 14, respectively.

Table 16

ANALYSE DE DEUX CIRCUITS NIGERIANS *

1

2

	ELEMENTS DU PRIX	Tahoua Ibadan (80 jours)		N'Gwu-Lagos (50 jours)	
		Valeur et frais à la tête	% de la valeur finale	Valeur et frais à la tête	% de la valeur finale
Achat	Type d'animal et de convoi	190 kg net (juillet); 60 têtes		190 kg net (juillet); 30 têtes	
	Prix de l'animal	15.500	69,6	16.000	69,6
Commercialisation	Frais de collecte de logeur	120 500	0,5 2,3	150 x	0,7 x
	Total frais d'achat	620	2,8	150	0,7
	Acheminement: Convoyeurs Transport moderne	1.720 x	7,7 x	500 2.630	2,2 11,4
	Total frais d'acheminement	1.720	7,7	3.130	13,6
	Frais généraux: Taxes	1.515	6,8	460	2,0
	Patentes	60	0,3
	Frais financiers (1)	825	3,7	700	3,0
	Solaire acheteur (2)	300	1,4	500	2,2
	Total des frais généraux	2.700	12,2	1.660	7,2
	Frais de ventes: Crédit (3) Autres frais	460	2,1	460	2,0
Total des frais	5.590	24,8	5.400	23,5	
Marge commerciale	Nette (4)	1.250	5,6	1.600	6,9
Ventes:	Prix par tête:	22.250	100,0	23.000	100,0
	Type d'animal et de Transport	170 kg net; à Pied		180 kg net; à Pied-train	
Marge bénéficiaire totale (1) + (2) + (3) + (4)		2.375	10,7	2.800	12,2
Valeur ajoutée par la commercialisation rapportée au Kg net sur pied (a)		40 F.CFA/Kg net sur pied		39 F.CFA/Kg net sur pied	

(a) Total des frais et de la marge commerciale nette.

*Source: SEDES, 1969, p. 307.

^{1,2}Routes 15, 16, respectively.

Table 17

Marketing Costs for Cattle Moved From Primary to Terminal Markets*
1972

	1	2	3	4	
	: Markoye	: Markoye	: Ayorou	: Tahoua	: Gotheys
	: to	: to	: to	: to	: to
	: Abidjan	: Lome	: Cotonou	: Lagos	: Lome
<u>COSTS AT PRIMARY MARKETS</u>					
	<u>CFA Francs per head</u>				
Broker's fee	: 250	: 250	: 500	: 500	: 500
Caretaking of herd	: 50	: 50	: 50	: 50	: 50
Taxes	: 570	: 570	: 370	: 370	: 295
TOTAL	: 870	: 870	: 920	: 920	: 845
<u>TRANSPORT COSTS</u>					
Trekking costs	: 350	: 1,300	: 700	: 600	: 1,300
Rail transport	: 2,650	: —	: 1,400	: 2,850	: —
Losses and shrinkage	: 1,500	: 1,900	: 1,200	: 1,500	: 1,900
Taxes enroute	: 1,620	: 3,240	: 1,000	: 1,000	: 2,800
TOTAL	: 6,120	: 6,440	: 4,300	: 5,950	: 6,000
<u>COSTS AT TERMINAL MARKETS</u>					
Broker's fee	: 100	: 500	: 500	: 500	: 500
Caretaking of herd	: 50	: 200	: 175	: 100	: 200
Truck transport	: —	: 200	: 200	: —	: 200
Taxes	: 1,800	: 1,100	: 2,225	: 1,000	: 1,100
TOTAL	: 1,950	: 2,000	: 3,100	: 1,600	: 2,000
TOTAL MARKETING COSTS	: 8,940	: 9,310	: 8,320	: 8,470	: 8,845

- (1) Markoye to Ouagadougou by foot; Ouagadougou to Abidjan by rail, 1,600 Km.
- (2) Markoye to Lome, entire distance by foot, 1,250 Km.
- (3) Ayorou to Parakou by foot; Parakou to Cotonou by rail, 1,400 Km.
- (4) Tahoua to Kano by foot; Kano to Lagos by rail, 1,500 Km.
- (5) Gotheys to Lome, entire distance by foot, 1,400 Km.

1,2,3,4,*Source: Bishop, 1972, p. 34.
Routes 17, 18, 19, 20, respectively.

Table 18

Taxes Imposed on Cattle Moved from Primary to Terminal Markets*
1972

	1	2	3	4
	: Markoye	: Markoye	: Ayorou	: Tahoua
	: to	: to	: to	: to
	: Abidjan	: Lome	: Cotonou	: Lagos
				: Gotheye
				: to
				: Lome
<hr/>				
<u>TAXES AT PRIMARY MARKETS</u>	<u>CFA francs per head</u>			
Buyer's license	: 70	: 70	: 50	: 50
Market tax	: 100	: 100	: 50	: 50
Municipal tax	: 75	: 75	: 195	: 195
Sanitary inspection	: 225	: 225	: 25	: 25
Certificate of origin	: 50	: 50	: --	: --
Export permit	: 50	: 50	: 50	: 50
<hr/>				
TOTAL	: 570	: 570	: 370	: 370
<hr/>				
<u>TAXES ENROUTE</u>				
Export tax	: 1,620	: 2,200	: 1,000	: 1,000
Import tax	: --	: 1,040	: --	: --
Transit tax	: --	: --	: --	: 760
<hr/>				
TOTAL	: 1,620	: 3,240	: 1,000	: 1,000
<hr/>				
<u>TAXES AT TERMINAL MARKETS</u>				
Market tax	: 500	: 100	: 125	: 100
Abattoir tax	: 1,000	: 750	: 1,500	: 750
Transport tax	: 300	: 100	: 150	: (1)
Sanitary inspection	: --	: 50	: 200	: 50
Departmental tax	: --	: 100	: 250	: 100
<hr/>				
TOTAL	: 1,800	: 1,100	: 2,225	: 1,000
<hr/>				
TOTAL ALL TAXES	: 3,990	: 4,910	: 3,595	: 2,370
<hr/>				

(1) Exact data on taxes at Lagos are not available, but are estimated as above.

*Source: Bishop, 1972, p. 35.

1,2,3,4 Routes 17, 18, 19, 20, respectively.

Table 19

Average Costs and Returns from Marketing Cattle - 1972*

	1	2	3	4
	: Markoye	: Markoye	: Ayorou	: Gotheye
	: to	: to	: to	: to
	: Abidjan	: Lome	: Cotonou	: Lome
	<u>CFA francs per head</u>			
Selling price per head	: 40,000	: 35,000	: 40,000	: 35,000
Cost price per head	: 25,000	: 20,000	: 25,000	: 20,000
Gross margin	: 15,000	: 15,000	: 15,000	: 15,000
Direct marketing	: 9,000	: 9,500	: 8,500	: 9,000
Interest on capital	: 3,000	: 3,000	: 3,000	: 3,000
Total costs	: 12,000	: 12,500	: 11,500	: 12,000
NET RETURNS PER HEAD	: 3,000	: 2,500	: 3,500	: 3,000

Note : The average price for cattle at Lome is less than at the other two markets because the quality of the animals marketed there is somewhat lower.

Marketing costs shown in Table V have been rounded to the nearest even figure.

*Source: Bishop, 1972, p. 36.

1,2,3,4 Routes 17, 18, 19, 20, respectively.

REFERENCES CITED

- Becker, John. 1974. "An Analysis and Forecast of Cereals Availability in the Sahelian Entente States of West Africa", Final Report to the United States Agency for International Development under Contract No. AID/CM/afr-c-7320.
- Bishop, Dwight R. 1972. "Livestock and Meat Marketing Patterns and Costs in the Entente and Adjoining Countries", Abidjan: United States Agency for International Development (mimeograph).
- Cohen, Abner. 1969. Custom and Politics in Urban Africa: A Study of Hausa Migrants in Yoruba Towns, Berkeley: University of California Press.
- Cohen, Abner. 1965. "The Organisation of Credit in a West African Cattle Market", Africa XXXV, 1, (1965), pp.
- Dupire, Marguerite. 1965. "The Fulani -- Peripheral Markets of a Pastoral People", in P. Bohanaan and G. Dalton (eds.), Markets in Africa, Garden City, New York: Anchor Books, pp. 93-129.
- Dupire, Marguerite. 1962. "Peuls Nomades: Etude descriptive des Wodaabe du Sahel Nigérien", Travaux et Mémoires de l'Institut d'Ethnologie, University of Paris, LXIV (1962).
- Forde, Daryll and Richenda Scott. 1946. The Native Economies of Nigeria, London: Oxford University Press.
- Frechou, H. 1966. "L'Elevage et le Commerce du Bétail dans le Nord du Cameroun", Cahiers ORSTOM, Series Sciences Humaines, Vol. III, no. 2, 1966.
- Gallais, J. 1967. "La Delta Intérieur du Niger", Mémoire de l'Institut Fondamental d'Afrique Noire, No. 79, Tome I and Tome II, Dakar.
- Hill, Polly. 1966. "Landlords and Brokers", in H.W. Ord, C. Fyfe, and D.N. McMaster (eds.), Markets and Marketing in West Africa, Proceedings of a Seminar held in the Centre of African Studies, University of Edinburgh, 29th and 30th, April, 1966, pp. 1-14.
- Mali. Bulletin Mensuel de Statistique, various issues.
- Mali. 1974. Dossier d'Information Economique, 1972-1973, Paris: Secrétariat d'Etat aux Affaires Etrangères Charge de la Cooperation, France.
- Nicholas, Guy. 1967. Circulation des Richesses et Participation Sociale dans une Société Hausa du Niger, Canton de Kantché, Bordeaux: Editions du Centre Universitaire de Polycopiage de l'A.G.E.B.
- Nicolas, Francis. 1950. Tamesna: Les Ioullemmeden de l'Est ou Touâreg 'Kel Dinnik', Cercle de T'âwa, Colonie du Niger, Paris: Imprimerie Nationale.

- P.E. Management Group (Nigeria) Ltd. 1960. The Market for Carcass Beef from the Northern Region of Nigeria, Report prepared for the Federal Ministry of Commerce and Industry (Lagos) and the Northern Nigeria Ministry of Trade and Industry (Kaduna).
- République du Niger and Société d'Etudes pour le Développement Economique et Social. 1966. Etude Démographique et Economique en Milieu Nomade dans le Cercle de Tahaoua, République du Niger, Paris: SEDES.
- Reyna, S.P. 1974. "The Assale-Serbewel Social Economic Study", N'Djamena: Lake Chad Basin Commission, (mimeograph).
- Rupp, Marianne. 1975. "Anthropology of the Maures, Peul, Guera, Bambara, and Soniuke in the Nara-Niono Plain", UNDP Project Mali 523, Unofficial translation by the U.S. State Department, (mimeograph).
- Sahlins, Marshall. 1972. Stone Age Economics, Chicago: Aldine-Atherton, Inc.
- Schneider, Harold K. 1968. "Economics of East African Aboriginal Societies", reprinted in E. LeClair and H. Schneider (eds.), Economic Anthropology: Readings in Theory and Analysis, New York: Holt, Rinehart and Winston, Inc.
- Société d'Etudes pour le Développement Economique et Social. 1969. Approvisionnement en Viandes de l'Afrique Centre Ouest, Paris: SEDES.
- Société d'Etudes pour le Développement Economique et Social. 1973. Approvisionnement en Viandes de l'Afrique de l'Ouest, Paris: SEDES.
- Société Ivoirienne de Gestion d'Etudes et de Services. 1971. Aspects de la Commercialisation du Bétail Sur Pied et de la Viande de Boucherie en Côte d'Ivoire, Abidjan: Ministère du Plan, République de Côte d'Ivoire.
- Stenning, Derrick J. 1959. Savannah Nomads: A Study of the Wodaabe Pastoral Fulani of Western Bornu Province, Northern Region, Nigeria, London: Oxford University Press.
- Stzyker, J. Dirck. 1975. "The Marketing of Malian Cattle", Tufts University (mimeograph).
- United States Agency for International Development. 1975. "Development Assistance Program, Fiscal Year 1975, Central and East African Region", Washington, D.C.: U.S. Department of State, (mimeograph).
- Upper Volta. Bulletin Mensuel d'Information Statistique et Economique, various issues.
- Vincent, Yves. . "Pasteurs, Paysans et Pêcheurs du Guimballa". (Incomplete Reference.)