

SMALL RUMINANT AND POULTRY MARKETING
IN THE MOSSI PLATEAU OF UPPER VOLTA

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SUMMARY AND POLICY CONCLUSIONS

Small stock are widely raised on the Mossi Plateau, as rural households own on the order of seven small ruminants and twenty fowl each. While ownership is widespread, per capita consumption of small ruminant meat (1.2 kg.) and poultry (1.0) is low in rural areas. Large numbers of sheep, goats, chickens and guinea fowl are exported each year from rural areas of the Mossi Plateau to urban centers such as Ouagadougou, Ouahigouya and Koudougou and to coastal West African markets, particularly the Ivory Coast.

The marketing channels are, for the most part, well-developed and efficient, given existing infrastructural and institutional constraints. Rural collectors operate efficiently on very low margins with little or no overhead. Larger scale traders move wholesale lots of small ruminants and poultry from rural assembly markets to urban centers of demand and to the railheads at Ouagadougou and Koudougou. The gross margins of these traders are proportionally higher than those for rural collectors due to higher transport costs and mortality, the need to provide feed and water, and higher net returns. Nevertheless, these larger traders move large volumes of small ruminants and poultry at relatively low cost, particularly during periods of peak demand (the Moslem and Christian holidays and Independence days in Upper Volta and Ivory Coast).

Exports of poultry have increased markedly since the 1960's, reaching 3500-4200 metric tons by the end of the 1970's. Small ruminant exports have fluctuated widely since the early 1960's, partially in response to periodic droughts. Significant increases in export taxes on sheep and goats in 1975 and 1982 have also contributed to the decline of recorded small ruminant exports since the peak years of the early 1970's, as well as doubtlessly encouraging clandestine export. Ivory Coast absorbs 85-90% of recorded exports of sheep and goats from Upper Volta. More sheep are exported than goats, reflecting the highly seasonal demand for sheep at Tabaski.

The short to medium term prospects for poultry exports are quite good, as Voltaic fowl are preferred by many Ivorian consumers to industrially produced breeds of improved poultry. Export prospects for small ruminants are not nearly as bright, given the highly seasonal nature of demand and high export taxes. Unless major increases in productivity are achieved by livestock raisers in Upper Volta, small stock exports will probably decline in the long term. This will result from population and income increases in Upper Volta during the 1980's and 1990's, particularly in urban areas, as well as from ambitious programs to promote sheep and broiler production in the Ivory Coast. Increases in taxes on sheep and goat exports could also contribute to this decline. Reduced exports will not necessarily have a negative effect on rural producers in Upper Volta, but they will lower the government's export tax revenues.

Presently the FED and the FAC are implementing small ruminant and poultry projects which aim to improve small stock health, housing, and nutrition on the Mossi Plateau. These projects are relatively modest interventions that are increasing small stock productivity and could probably be replicated on a broader scale. AFRICARE is also implementing small ruminant and poultry extension and sheep crossbreeding schemes in the Seguenega Subprefecture of Yatenga ORD. The extension program has been very successful to date, while the crossbreeding program may be difficult to expand on a large scale due to feed constraints, the generally low level of livestock management practiced by small stock raisers, and the seasonality of demand for fattened sheep.

While promising interventions are underway in the areas of small ruminant and poultry production, little has been done to promote small stock marketing. The parastatal ONERA was created in 1976 to promote livestock marketing, and it does export chilled red meat to coastal markets, but these exports comprise only a small fraction of total livestock exports. Moreover, ONERA's efforts to develop red meat marketing channels paralleling private sector marketing of live cattle and small ruminants have been financially unsuccessful. ONERA has underutilized its slaughter facilities and cold storage at Ouagadougou and

Bobo-Dioulasso, its fleet of refrigerated trucks, and refrigerated containers for rail transport. In 1980-81 ONERA made an abortive attempt to market slaughtered and chilled fowl in coastal markets. Yet the World Bank and the FED are considering funding the construction of poultry slaughter facilities, which would process local and improved breeds of poultry for refrigerated transport to coastal markets. If such an intervention is undertaken, ONERA will most likely be charged with operation of the slaughter facility and cold storage, as well as some of the refrigerated transport.

The most important livestock marketing problems faced by private traders are:

(1) Lack of access for formal credit for the purchase of livestock and payment of transport costs and export taxes. High working capital requirements constitute a significant barrier to entry for exporters.

(2) The shortage of feed and water for small ruminants during treks to market and prior to shipment or slaughter, particularly during the hot dry season. Feed and water shortages also plague rural producers.

(3) Transport problems in the long distance trade. There are no livestock holding or receiving facilities at railheads and terminal markets. Poultry shipping crates and railcars for transporting small ruminants and poultry are poorly designed and overcrowded. Frequent delays in rail and truck transport are encountered, as railway, police and customs officials are responsible for long stops at railway stations, police checkpoints and customs posts.

(4) High Export Taxes. Exporters pay 22.23% (small ruminants) and 10.57% (poultry) of assessed livestock values at the time of rail shipment or at customs posts along major roads. Traders must therefore dispose of large sums of cash for paying taxes in addition to the working capital required for livestock acquisition and payment of transport costs.

The above problems are of both an institutional and infrastructural nature. For example, delays in rail transport reflect the low priority given to livestock by the RAN, while dashing of government officials is a means of supplementing low salaries. Export taxes are an important source of government revenue, and there is probably little or no scope for lowering these in the medium term. Poultry and small ruminant mortality and shrinkage could be lowered in the course of rail transport by improving the design of railway cars, but institutionally induced freight delays could also be reduced. Construction of paved roads, such as the Yako-Ouagadougou axis, as well as upgrading and improved maintenance of other major roads on the Mossi Plateau, will lower transport costs. These investments would improve traders' access to livestock in rural areas, increase the numbers of buyers and hence competition for small stock, and probably lead to higher prices for producers.

USAID can most effectively assist the small ruminant and poultry subsectors by:

1. Working closely with AFRICARE, the FED and the FAC in improving small ruminant health, sanitation and management in rural areas of the Mossi Plateau. More vigorous extension efforts and more widespread vaccination campaigns and parasite control programs are required.
2. Examining opportunities for providing credit or other forms of assistance to traders' associations, such as the Ouagadougou small ruminant traders' organization. This could lead to improvements in feed and water supply for trade stock, better holding and transport facilities, and increased access to working capital for purchase of trade stock and payment of transport costs and export taxes.
3. Fostering a dialogue with the Livestock Service, ONERA, the RAN, the Customs Service (the Ministry of Finance), other interested Voltaic government agencies, private firms, and donor agencies that addresses the institutional and infrastructural problems constraining the small ruminant and poultry trade.
4. Providing technical assistance and training to government officials, para-veterinarians and private firms in small stock health, nutrition and management, livestock sector data collection and analysis, and livestock sector planning. This would improve the capability of public and private sector individuals to plan, implement and monitor interventions, and generally to improve subsector performance through an ongoing and iterative process. Such training would be an integral part of the Agricultural Sector Development Support strategy.
5. Conducting further applied research on small stock production and marketing in collaboration with the Livestock Service, ONERA, AFRICARE, the FED and the FAC. A study of demand for small ruminants and poultry products would be timely and useful in improving livestock sector planning. Such a study should be carried out in rural and urban areas of Upper Volta and would examine consumption of different types of livestock products by income strata and ethnic/religious group. Voltaic data collection and analysis capabilities could be strengthened by involving Voltaics in the design, implementation and analysis of such a study.

I. PRODUCTION AND MARKETING OF SHEEP, GOATS AND POULTRY

A. Small Ruminant and Poultry Production on the Mossi Plateau

Small ruminant and poultry ownership are widespread on the Mossi Plateau and throughout Upper Volta. Using World Bank estimates of the small ruminant population of Upper Volta by ORD for 1977, the 1983 sheep and goat population is probably about two million for the ORDs of Ouagadougou, Koudougou, Kaya, Ouahigouya and Koupela, which encompass virtually all of the Mossi Plateau, as well as some adjacent non-Mossi zones.¹ This is nearly 40% of the national small ruminant herd of about 5.07 million.² Mossi households in rural areas probably own 7-8 small ruminants on average, assuming an average household size of 5.7 people and a 1983 population of 3.8 million inhabitants.³ Estimates of poultry holdings are far less reliable. While the Livestock Service reports a national flock of about 12 million fowl, comprised mostly of chickens and guinea fowl, the staff of the FAC funded Project Development Aviculture Villageoise have estimated the national poultry population at 20-25 million.⁴ Assuming that half of these fowl (11.25 million) are raised in rural areas of the Mossi Plateau, which may be a conservative estimate, we estimate that rural Mossi households own an average of nearly 20 chickens and guinea fowl.⁵ Although the small ruminant and poultry populations are not known with any precision, it is clear that small stock are an important asset for a wide range of rural Mossi households.

Small stock are an integral part of the farming systems of the semi-arid zone, serving as a relatively liquid reserve that can be used to meet immediate cash needs and to provide insurance against grain production shortfalls. Both small ruminants and chickens are also slaughtered at the time of naming ceremonies, dry season festivals, funerals and in honor of visiting relatives and friends. Exchanges of small ruminants allow better off households to aid poorer households, particularly in times of drought, pest damage, and need. Chickens and guinea fowl are typically sold to meet minor cash needs (e.g., to pay taxes or school fees and to buy clothes and condiments).

B. Smallholder Marketing of Small Ruminants and Poultry

The marketing of small ruminants and poultry follows a seasonal pattern. Sales of sheep multiply several fold in the months before the Moslem holiday Tabaski. Farmers, small-scale merchants and some urban households fatten rams on household wastes, freshly cut (or stored) grasses, agricultural by-products (groundnut haulm, millet stalks and leaves), and occasionally grain and agro-industrial by-products (cottonseed cake, groundnut cake). Many sheep are trekked or trucked from villages on the Mossi Plateau to the urban centers of Ouagadougou, Bobo-Dioulasso, Koudougou, Ouahigouya, Kaya and Koupela for sale and slaughter. Others are trucked directly from the Mossi Plateau to Ivory Coast,

Togo, Benin and Ghana, or to railheads at Ouagadougou and Koudougou. From there they are shipped by rail to Bouake and Abidjan. While rams are preferred for customary slaughter during festivals, goats represent a significantly larger proportion of slaughter at rural and urban markets. The age structure of small ruminant herds in Yatenga ORD clearly shows that small farmers hold breeding stock for as long as the females are reproductive, while surplus males are culled for slaughter or sale by the time they are two years old.⁶ Many observers argue that farmers and herders practice a form of negative selection in exploiting their herds, slaughtering and selling the largest males and reserving inferior stock for breeding.

Poultry sales are less seasonally pronounced than for sheep, but seasonal fluctuations in supply and demand do influence marketings. Producers sell more chickens during the first half of the dry season (October-February) for two principal reasons. First, most of the annual egg production and therefore hatchings are concentrated during the hot season (April-June). Under typical management practices, where chickens obtain most of their feed through scavenging, chickens do not reach market weights (800 grams) in less than 22 weeks. Production takes place throughout the rainy season, and the new flock is not ready for exploitation before October-November. Second, producers often prefer to sell poultry in the early months of the dry season to avoid the characteristically high mortality of the latter half of the dry season (Newcastle's disease). Poultry sales also increase markedly in December and January in response to increased demand for poultry at Christmas, New Year's Day, and Independence Day celebrations in Upper Volta (December 11) and Ivory Coast (January 7).

C. Marketing Channels for Small Stock

The marketing channels for small ruminants and poultry are well-established and low cost. Most small ruminant sales take place at rural markets, which meet every third day on the Mossi Plateau. There is some door-to-door collection of small ruminants by rural assemblers, who trek the animals to important livestock markets (Youba, Pouytenga, Kaya) for resale to wholesale merchants, butchers and exporters. Butchers residing in towns near the secondary markets buy small stock in the markets and graze the animals before slaughter. Traders and exporters truck animals acquired in assembly markets to the principal cities of Upper Volta (Ouagadougou, Koudougou, Bobo) or to the coastal countries.

In contrast to small ruminants, a greater proportion of poultry sales take place at the farmgate. Rural collectors assemble door-to-door and transport wooden cages filled with chickens and Guinea fowl (25-50/cage) on the back of their bicycles and molyettes. Poultry are also suspended from the handlebars. These collectors sell several dozen to several hundred chickens and guinea fowl in wholesale lots to buyers at the principal rural markets. The wholesale traders then truck the wooden cages to major urban centers.

Rural assembly is low cost and relatively efficient, as small ruminant and poultry collectors operate on low margins and with little or no overhead. Transport of small stock from rural assembly markets to urban areas and railheads is most costly and could be improved. Upgrading and improved maintenance of the truck roads in the Mossi Plateau would lower transport costs and lead to higher livestock prices in rural assembly markets if increased competition were fostered. The numbers of sheep, goats and poultry marketed in the Mossi Plateau region could also increase. Trucking of poultry from rural assembly markets to urban centers and railheads could also be improved if the wooden cages used in transport were not exposed to the elements during shipment, which presently takes place when the cages are strapped to the roofs of covered pickups or placed on the top of truckloads. Losses from this form of poultry transport are low, however, as the distances involved are typically less than 200 kilometers.

While transport from rural areas of the Mossi Plateau to urban centers and railheads within Upper Volta does not result in high losses, mortality and shrinkage are a more serious problem in exportation of small stock. Small ruminants and poultry are shipped to Ivory Coast, Togo and Benin by truck and by rail.¹ The roads from Ouagadougou to Lome and Abidjan are paved, which should permit truckers to make the long haul to the coast in 24-30 hours. Trucking often takes considerably longer, however, due to frequent delays encountered at police and customs checkpoints in Upper Volta and Ivory Coast. Yet trucking is generally more rapid than rail transport.

Delays in rail transport, poorly designed railcars for shipping livestock and inadequate livestock holding and receiving facilities at the railheads induce higher mortality and shrinkage than in the case of truck transport.

All poultry and some sheep and goats are shipped in uncovered flat cars, exposed to sun wind and rain. It is not uncommon to stack 5-6 poultry cages on top of one another. Generally, ventilation is poor, watering and feeding are inadequate, and exposure to the elements stresses the hardy stock. Many small ruminants are also transported in closed and covered freight cars, which are poorly ventilated and become excessively hot during the latter half of the dry season. Furthermore, small ruminant and poultry excrement are not removed from the rail cars during the course of the voyage, which leads to contamination of feed and water, particularly in the case of poultry.⁸ Mortality on the Ouagadougou-Abidjan trip, which takes 2-3 days, is reported to be 2-5% for small ruminants and typically 20-30% for poultry.⁹ Shrinkage in the course of the voyage can also be a problem, especially when delays in transport are encountered.

D. Structure of Small Stock Marketing

Access to capital has a profound influence on the structure of the trade in small ruminants and poultry. Rural

collection of small stock requires relatively modest sums of working capital and little investment. Collectors assemble on foot or via bicycle and they typically buy small lots of sheep and goats (5-20 head) or 100-200 poultry at one time. Short term credit is sometimes extended by producers to rural assemblers, who pay the sellers when they receive payment from wholesale buyers. The working capital required for rural collection is on the order of 10,000-100,000 FCFA. The mean sum available to rural assemblers is unknown, but it is probably far closer to 10,000 FCFA than 100,000 FCFA. There are numerous small-scale collectors who assemble small lots. Rural collection is highly fragmented and seemingly competitive.

While the capital requirements for entry into rural collection of small stock are relatively modest, entry into the wholesale and export trade necessitates greater investments. Long distance traders' frequently own trucks for transporting small stock from rural collection zones to urban markets and railheads or to coastal markets. Other wholesale traders have to rent space on trucks or rent out trucks. Wholesale traders who sell small stock in Ouagadougou and other urban markets usually have to hire herders to watch over livestock before they are entirely sold. Exporters need to dispose of additional working capital for payment of export taxes, which are presently 3335 FCFA per sheep, 2890 FCFA per goat, and 61 FCFA per fowl, as well as rail or truck transport to coastal markets. Hence, only the wealthiest individuals or those with access to formal credit are able to participate in the export trade. Access to formal credit is generally restricted to traders who can offer warehouses, buildings, houses and vehicles as collateral. The scarcity of such formal credit also invites abuses. There are some 15-20 poultry exporters and roughly the same number of small ruminant exporters based on the Mossi Plateau. Although the export trade is far more concentrated than rural collection or rural-urban wholesale trade, it appears to be reasonably competitive and free of collusive practices.

II. Estimated Offtake and Consumption of Red Meat and Poultry

A. Estimated Offtake and Consumption for 1981

Offtake from the small ruminant herd of Upper Volta was some 25-30% in 1981. Most estimates of small ruminant meat consumption are based upon an assumed offtake rate and recorded carcass weights for samples of sheep and goats. Rather than assuming a rate of offtake, we have taken the unconventional approach of calculating offtake from recorded slaughter and exports and guesstimates of unrecorded slaughter and trade flows. These estimates are shown in Table 1.

TABLE 1

Small Ruminant Offtake Estimate for Upper Volta, 1981

| | | |
|--|-------------|------------------------|
| Small Ruminant Population | | 4,780,000 ^a |
| Slaughter | | |
| Recorded | | 450,000 ^b |
| Unrecorded | 450,000 - | 675,000 |
| | | <hr/> |
| Sub-Total (2-2.5 times recorded slaughter) | 900,000 | 1,125,000 |
| Exports (on the hoof) | | |
| Recorded | | 160,000 ^c |
| Unrecorded | | 80,000 ^d |
| | | <hr/> |
| Sub-Total | | 240,000 |
| Total Offtake | | |
| Recorded | | 630,000 |
| Unrecorded | | <u>530,000-755,000</u> |
| Sub-total | 1,160,000 - | 1,385,000 |
| Rate of Offtake | | 24 - 29% |

Notes for Table I

^a The estimate of the small ruminant population assumes an average annual growth rate of 3% over the period 1975-1981.

^b Recorded slaughter of small ruminants was 468,853 head in 1981. This figure includes animals slaughtered for export (as chilled carcasses). 126.5 metric tons of mutton and goat meat were exported in 1981, which represents 17,557 small ruminants, assuming an average carcass weight of 7.2 kilograms. Subtracting the exports from total slaughter, we obtain an estimate of 451,196 small ruminants for recorded slaughter for domestic (internal) consumption.

^c Source: Statistiques, 1981, Service de l'Elevage.

^d This adjustment is made in order to capture unrecorded exports, which are estimated to comprise one third of total exports. The Ministere de la Production Animale of the Ivory Coast recorded information of 214,932 small ruminants from Upper Volta in 1981. Adding recorded exports from Upper Volta to Ghana, Benin and Togo, we obtain a revised estimate of 236,423 sheep and goats. Since there is alleged to be unrecorded export of small ruminants to Ghana, Benin and Togo, we estimate that approximately 240,000 sheep and goats were exported from Upper Volta in 1981.

We estimate that 45-55% of offtake from the national small ruminant herd is unrecorded. The main component of unrecorded offtake is household slaughter of sheep and goats, particularly at the time of festivals and in honor of visiting (and deceased) relatives and friends. Unrecorded slaughter is probably as great or somewhat greater than recorded slaughter. A second component of unrecorded offtake is clandestine exports. By comparing exports of small ruminants from Upper Volta (Table 2) with recorded exports of Voltaic small stock into the Ivory Coast (Table 7), we estimate that roughly one-third of small ruminant exports are unrecorded. This finding accords with reports by traders of increased clandestine export of sheep and goats in response to the export tax hike in 1982. Imports of sheep and goats are probably negligible (5,600 in 1978) and are therefore not included in the offtake calculation.¹⁰

In estimating consumption of mutton and goat meat in Upper Volta in 1981, we assume that offtake from the small ruminant herd was 29%, which is typical for small ruminant herds raised extensively in Africa on unimproved rangeland. As shown in Table 2, small ruminant meat consumption was an estimated 1.9 kilograms per capita in 1981, assuming an average carcass weight of ten kilograms per slaughtered animal. Recorded slaughter statistics show that per capita consumption was higher in Ouagadougou and Bobo-Dioulasso (3.3 kilograms) than in secondary urban (or peri-urban) and rural areas (1.7 kilograms), where consumption is calculated as a residual (total offtake - urban slaughter - exports).

Comparing our estimate of per capita consumption of mutton and goat meat with earlier estimates (see Table 2), it appears as if consumption has declined since 1967 and 1977 but is roughly the same as estimated in 1978. In addition to consuming an average of 1.9 kilograms of small ruminant meat per capita in 1981, residents in Upper Volta consumed some 0.3 kilograms of small ruminant offals in 1981.¹¹

It is important to note that consumption of red meat from ruminant livestock represents about 80% of total red meat and poultry consumption. There are no available estimates of consumption of game, fish and eggs for Upper Volta. Small ruminant meat consumption constitutes roughly 25% of consumption of red meat and poultry, while beef consumption represents 55-60%. Pork consumption makes up 5-6% of total red meat and poultry consumption, while poultry constitutes 10-15%. Mutton, goat meat and poultry consumption represent, therefore, 35-40% of red and white meat consumption (excluding game and fish) in Upper Volta. Small ruminants and fowl are therefore an important source of animal protein for Voltaic consumers, as well as an important source of revenue for rural households.

TABLE 2

RED MEAT AND POULTRY CONSUMPTION ESTIMATES FOR UPPER VOLTA
(IN KILOGRAMS PER CAPITA)

| | 1967 | 1977 | 1978 | 1981 |
|------------------|------|------|------------------|------------------|
| Beef | 4.3 | 4.0 | 4.7 ^b | 3.7 ^c |
| Mutton/Goat Meat | 2.5 | 2.5 | 2.0 ^b | 1.9 ^d |
| Offals | 1.3 | 1.3 | - | 1.2 ^e |
| Sub-Total | 8.1 | 7.8 | 6.7 | 6.5 |
| Pork | 0.5 | | 0.5 | 0.5 ^f |
| 1.8 ^a | | | | |
| Poultry | 1.0 | | 0.9 | 1.3 ^g |
| Total | 9.7 | 9.6 | 8.1 | 8.3 |

Sources:

1967 estimates - SCET, La production animale voltaïque - perspectives de développement, Tome II, "Note de Synthèse," Paris, 1972.

1977 estimates - Herman and Makinen, Livestock and Meat Production, Marketing, and exports in Upper Volta, CRED, University of Michigan, 1980.

1978 estimates - World Bank, Upper Volta: Livestock Subsector Review, Report No. 3306-UV, November 1982.

1981 estimates - author estimates, using Statistiques du Service de l'Élevage 1981; poultry estimate from Gergely, FAD, Enquête sur les possibilités de production et de commercialisation de la volaille, Haute-Volta, 1980.

^aHerman and Makinen use this estimate (1.8 kg.) for all remaining meat. It is unclear whether the estimate is for other red meat or for other red meat and poultry.

^bThe World Bank estimates of beef and small ruminant meat consumption include consumption of offals.

^cThe 1981 estimate of beef consumption assumes offtake of 11% from the national herd of 2,815,000 head, exports of 81,000 head (recorded exports 1.25) and domestic slaughter of 228,650 head (assumed offtake - exports). An average carcass weight of 100 kilograms per head is assumed.

^dAssuming a 29% offtake rate and exports of 260,000 small ruminant equivalent, it is estimated that 1,125,000 small ruminants were slaughtered in 1981. An average carcass weight of ten kilograms is assumed.

^eCattle offals are assumed to equal 25% of cattle carcass weights and 15% of small ruminant carcass weights.

^fAn offtake rate of 60% and an average carcass weight of 25 kilograms are assumed (see World Bank, Upper Volta: Livestock, Subsector Review, 1982).

^gThis estimate is taken from Gergely, FAO, Enquête sur les possibilités de production et de commercialisation de la volaille, Haute-Volta, 1980.

B. Projected Future Consumption

Herman and Makinen, IEMVT and the World Bank have projected small ruminant meat consumption for Upper Volta.¹² Herman and Makinen have forecast that per capita consumption of mutton and goat meat will increase from 2.48 kilograms (1977) to 2.55 kilograms in 1985, assuming an income elasticity of demand for red meat of 1.0, annual growth in per capita income of 0.6%, and no changes in the prices of small ruminant meat relative to the prices of other red meats, poultry, fish and other consumer goods. They project that per capita consumption will remain higher in rural (2.58 kg.) than in urban (2.25 kg.) areas in 1985, which does not accord with our estimates for 1981.

In projecting supply and demand for red meat and poultry in the year 2000, IEMVT assumes that higher productivity per animal (with no appreciable increase in herd size) will allow per capita consumption of red meat and poultry to increase slightly between 1977 and 2000. They argue that exports of livestock will decline between 1977 and 2000. They argue that exports of livestock will decline to zero and near zero in the long run. In contrast, the World Bank argues that changes in relative prices, induced by the increasing purchasing power of coastal consumers vis-a-vis Voltaic consumers, will probably keep livestock exports from

Upper Volta at present levels, despite growth in population, urbanization and incomes in Upper Volta. At the same time, however, the World Bank points out that trends in consumption of red and white meat are difficult to predict with any accuracy due to poor data quality and lack of information about key parameters.

We agree strongly with the World Bank's conclusion, believing that income growth in the Ivory Coast and other coastal West African importing countries (Togo, Benin, Nigeria) will strongly affect relative livestock and meat prices and hence the magnitude of exports from Upper Volta and other Sahelian countries. If income increases in coastal West African countries continue to overshadow those in the Sahel, then increases in population and urbanization in the Sahel will have little effect on livestock flows. Coastal consumption levels will be maintained (under this scenario) at the expense of Sahelian consumers. This would benefit Sahelian livestock producers, as prices for Sahelians stock would be bid up by the strong coastal demand. Per capita consumption of livestock products would decline in the Sahelian states, however, which would negatively affect nutrition in countries where consumption of animal protein is already well below consumption in industrial countries. As per capita consumption of livestock products declines in Upper Volta and other Sahelian countries, there will be strong incentives to impose higher export taxes and quantity restrictions on exports. Yet even if these measures were imposed, exports might not decline, given the relative ease of clandestine border crossing and opportunities to bribe police, customs and railway officials.

Another important factor that will affect the volume of exports from Upper Volta and Voltaic consumption levels will be the delivered price of frozen and chilled meat imports in Abidjan and other coastal markets relative to the prices of Sahelian livestock. Low prices for red meat exported from South America to Abidjan in the mid 1970's undercut higher priced Sahelian exports. The supply shortage created by drought-induced mortality exacerbated this situation, pushing livestock prices higher. Although world red meat prices rose in the late 1970s and Sahelian livestock are competitively priced in coastal markets at present, this could change periodically in response to cyclical swings in world meat supply.

III. Small Ruminant and Poultry Exports: Past Trends and Future Prospects

Data for exports of small ruminants and poultry are recorded by the Livestock Service and customs officials. There is some unrecorded export of small stock, particularly from areas near the borders of Ivory Coast, Togo, Benin and Niger, yet official figures probably capture 80%-90% of actual exports in most years. This is because small ruminants cannot be trekked long distances to export markets and are therefore shipped by truck and rail. There is some evidence, however, that clandestine exports of sheep and goats have increased in recent years as export taxes have

been raised. Poultry exports are probably underestimated by at least 20% as a result of the method used by customs officials to tax exports. In order to avoid actual counting of poultry exports, customs officials assume that each wooden cage contains 70 fowl. Given the relatively high level of the poultry export tax (61 FCFA/fowl), exporters have an incentive to crowd as many fowl as possible into the cages. Typically 80-90 fowl are shipped per cage, which complicates feeding and watering and induces higher mortality than under less crowded conditions. There may also be considerable unrecorded export of poultry due to transport of small lots across borders.

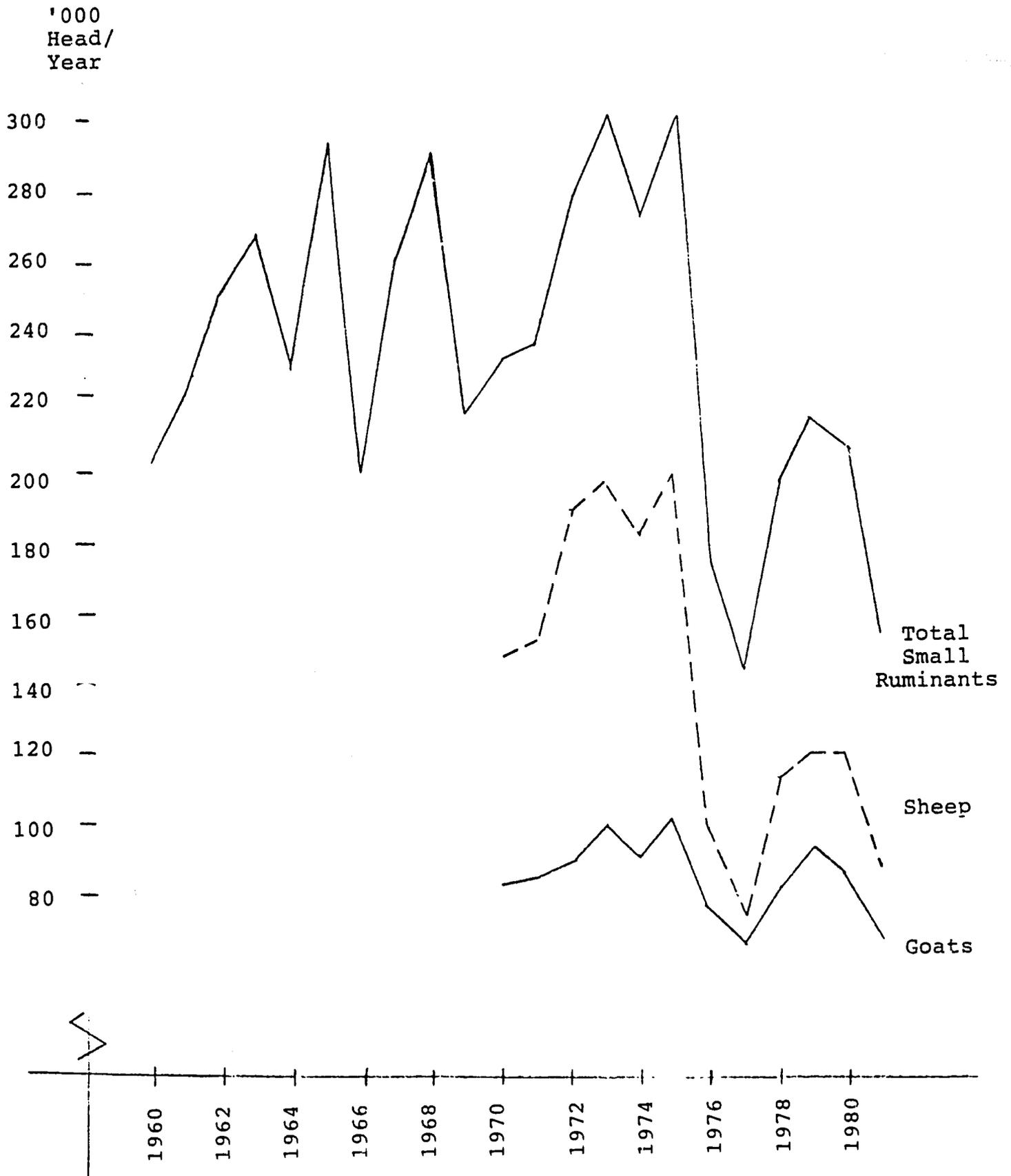
Despite the fact that small ruminant and poultry export statistics fail to capture all exports, the official figures can be used to interpret general trends in exportation over the past twenty years. As shown in Figure 1, small ruminant exports fluctuated between 200,000 and 300,000 head per year between 1960 and 1975, probably in response to drought and disease outbreaks. Recorded exports declined precipitously in 1976-77, partially as a consequence of herd reconstitution following prolonged drought of the first half of the 1970s but also in response to an increase in the small stock values (mercuriales) used for assessing export taxes in 1975. Recorded exports increased from a twenty year low of 144,000 in 1977 to 217,000 in 1979, but then fell to 159,000 in 1981. This corresponds with trends observed and reported by private traders, who claim that exports were even lower in 1982 than in 1981. This decline may be the consequence of yet another increase in small ruminant assessed values in 1982¹⁴. It may also reflect the beginning of a long term downturn in sheep and goat exports, which has been predicted by the CILSS and Club du Sahel¹⁵. This secular trend was anticipated in light of increasing population and income growth in Upper Volta and other Sahelian countries (particularly in urban areas), which will probably reduce Sahelian livestock and red meat exports to near zero by the end of the century.

While Ghana was the principal market for Voltaic exports of sheep and goats during the early 1960s, as shown in Table 6, Ivory Coast has absorbed at least three-fourths of all recorded exports since 1965. Since 1972 this proportion has never fallen below 85%. Togo and Benin have generally imported less than 5% of recorded small ruminant exports from Upper Volta since the mid-1960s, but they have imported larger numbers of small stock in recent years (over 18,000 or 11% of recorded exports from Upper Volta in 1981). There is alleged to be a significant number of unrecorded sheep and goat exports to Togo and Benin.

More sheep are exported from Upper Volta than goats, reflecting the strong seasonal demand for sheep preceding Tabaski. Fifty-seven percent of recorded small ruminant exports from 1978 through 1981 were sheep. Monthly export data for the Ouagadougou and Koudougou railheads (see Table 8) show the marked seasonality of small ruminant exports. Forty-two percent of recorded small ruminant exports from these two railheads in 1982 were shipped to the Ivory Coast during the month of September, as Tabaski was celebrated on

Figure 1

Trends in Recorded Exports of Small Ruminants,
1960-1981



Source : Statistiques du Service de l'Elevage

September 29. In 1979, when Tabaski was celebrated during late October, 32% of the small ruminants shipped by rail from Ouagadougou and Koudougou were exported in October.¹⁵

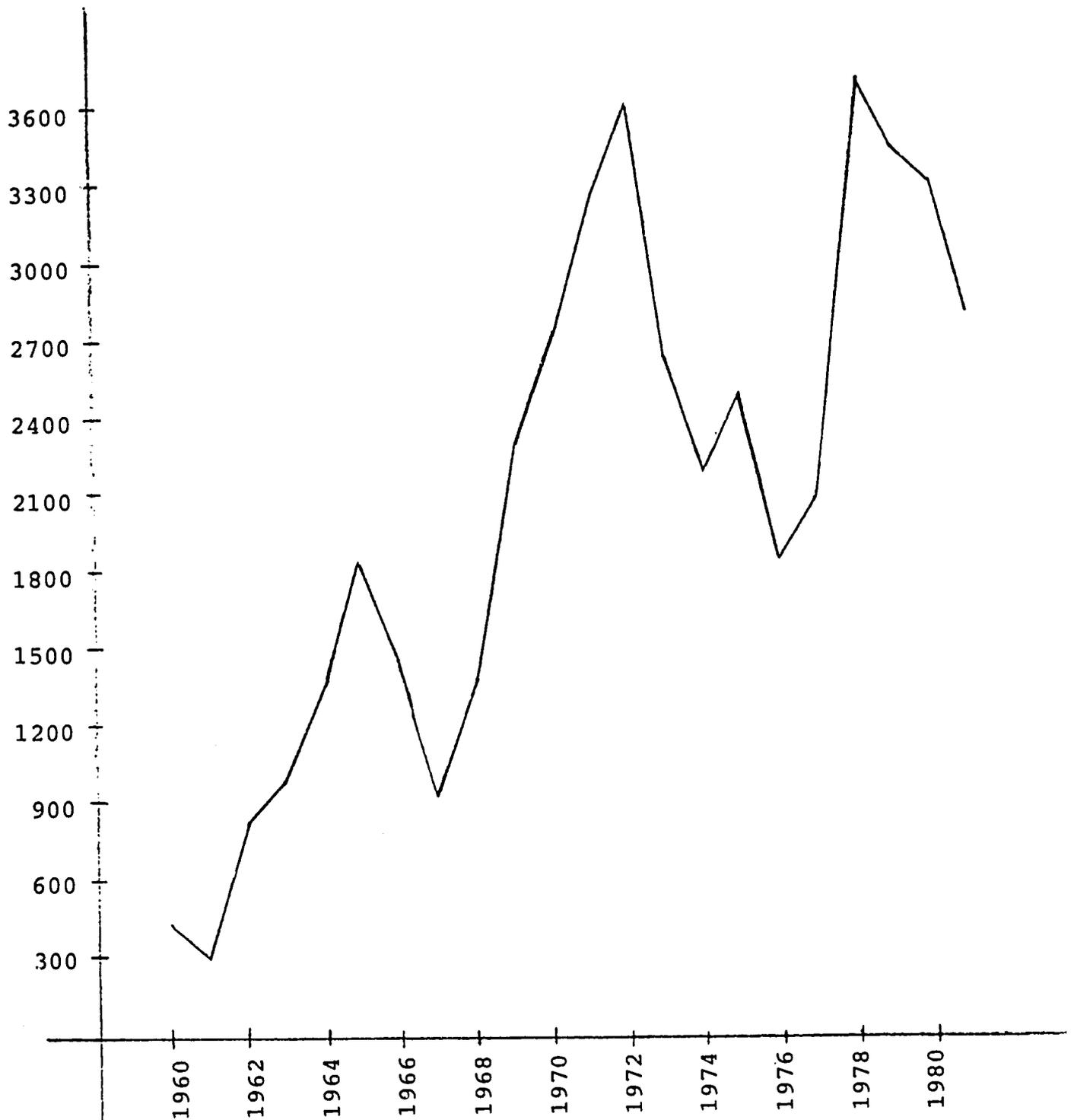
Exports of chilled mutton and goat meat from Upper Volta have fluctuated widely from 1967 through 1981, primarily in response to the delivered price of Voltaic red meat in Abidjan relative to world meat prices. Small ruminant meat exports from Ouagadougou fell to 1.7 metric tons in 1976, precisely at the time that the government of Upper Volta elaborated a policy of promoting red meat as opposed to live animal exportation. This coincided with the flooding of the Ivorien market with cheap red meat, principally from South America. Red meat exports from Ouagadougou remained low through 1980 (20.5 metric tons) and then expanded to 126.5 metric tons in 1981. Small ruminant meat exports from Upper Volta for 1981 were 730.8 metric tons, which was no more than 5.6% of total recorded export of small ruminants (both on the hoof and as red meat). The medium to long term prospects for Voltaic exports of mutton goat meat will depend primarily upon CIF prices in coastal markets relative to world market prices. It is important to note, however, that the high cost of refrigerated transport from Ouagadougou to Abidjan places Voltaic red meat exports at a competitive disadvantage.

While small ruminant exports have declined in recent years, recorded poultry exports were higher from 1978 to 1980 than during any other three year period since 1960. As shown in Figure 2, poultry exports expanded rapidly from 1960 to 1972, fell from 1972 through 1976, and trended upward again from 1977 through 1980. The decline in the mid 1970s was probably the consequence of the drought, which undoubtedly was accompanied by epidemic outbreaks of fowl cholera and Newcastle's disease. Annual exports of poultry from the Ouagadougou and Koudougou railheads, shown in Table 8, suggest that poultry exports peaked in 1980 and declined nearly 20% from 1980 to 1982. While steady production increases took place from 1976 through 1982, it is possible that urban consumption of poultry expanded, absorbing a steadily increasing proportion of the available surplus.¹⁶

Poultry exports exhibit far less seasonal concentration than sheep exports, although they are seasonally above trend during the month of December in response to the strong Ivorien demand at Christmas, New Year's Day and Independence Day (January 7). Fifteen to twenty percent of annual poultry exports from the Ouagadougou and Koudougou railheads to Ivory Coast occurred during the month of December from 1978-1982.

Long term prospects for poultry exports from Upper Volta are uncertain. While Ivorien consumers are alleged to prefer Voltaic poultry to improved stock, large-scale commercial production of broilers has expanded rapidly in Ivory Coast. There is a large expatriate population in Abidjan, which constitutes the principal consumer group for commercially produced poultry. Moreover, there are increasing numbers of middle and upper class Ivoriens who can afford to buy poultry regularly and prefer to purchase

Figure 2 Recorded Poultry Exports, 1960-1981



Source¹ : Institut National de la Statistique et de la Demographie, and Direction de la Douane, as reported in Essai d'etude sur l'implantation d'un abattoir de volailles en Haute-Volta, Pallo Pierre Evariste Ferdinand, 1981.

slaughtered fowl that are ready for cooking. In many of these families both wife and husband work, so the women no longer have the time to slaughter and skin fowl prior to cooking. Furthermore, the more tender white meat of improved breeds is conducive to faster cooking than unimproved poultry, which are typically cooked for hours in Ivorien stews. Nevertheless, there are at least one million Voltaics in Ivory Coast, and less wealthy Ivoriens. Despite these changes in consumer preferences that are accompanying rapid urbanization, there will probably continue to be a strong market for Voltaic poultry exports in Ivory Coast. Some consumers, particularly Voltaic expatriates, will be willing to pay somewhat of a premium for Voltaic stock.

There have been no exports of frozen fowl to the coastal countries, except for a 1980-1981 ONERA experiment in which very small quantities of frozen guinea fowl were exported to Ivory Coast and Togo.¹⁷ The World Bank is considering funding of several poultry abattoirs, but the location and capacity of such units have not yet been determined.¹⁸ It is also uncertain whether such facilities are needed or could be economically viable, given the apparent preference for live poultry and unimproved Voltaic breeds in the Ivory Coast by many consumers. A thorough analysis of the demand for different types of poultry products (live vs. chilled/frozen fowl, unimproved vs. improved breeds) and trends in consumer preferences in the Ivory Coast is required before potential demand for live and slaughtered Voltaic stock can be gauged. Finally, officials in the Ministry of Animal Production in Ivory Coast and the CEBV (Communaute Economique du Betail et de la Viande) report the Ivorien market is already saturated with improved breeds produced in large-scale commercial units.

IV. Ongoing and Potential Interventions in Small Ruminant and Poultry Production

A. Small Ruminant Production

The FED has financed a small ruminant project, whose aim is to improve small ruminant health, management and feeding practices in the Yatenga O.R.D. of the Mossi Plateau. This project has conducted research on small ruminant production and generated useful data on the growth performance, fecundity and mortality of sheep and goats. It has also trained rural paraveterinary assistants in basic principles of small ruminant health and management. These agents have in turn provided health and extension services to roughly 10% (30,000 head) of the small ruminant herd in Yatenga. The second phase of the project (1982-1986) will expand coverage in Yatenga and initiate programs in the Kaya and Sahel O.R.D.'s.

USAID is currently funding the Seguenega Integrated Rural Development Project, which is being implemented by AFRICARE. This project has attempted to introduce cross-breeding of Fulani (Bali-Bali) rams with locally raised Mossi ewes. The cost of acquiring the Fulani rams is high, since they must be trucked from markets in the Sahelian zone

(Gorom-Gorom, Markoye) to Seguenega over poor roads. Moreover, these rams are not as well adapted to the savannah zone of Seguenega as the local Mossi stock, and mortality has been higher than acceptable. The Fulani rams are also much larger animals than the local breeds, attaining twice the liveweight (50-60 Kilograms as opposed to 25-30 Kg.). Their nutritional requirements are therefore correspondingly higher.

If cross-breeding is promoted on a large scale, the demand for the limited local feed supply will increase. In crop years such as the 1982-83 season, when many households harvested little or no grain in the Seguenega region, the problem of dry season feeding is compounded. This problem can be resolved in part through supplemental feeding of minerals, cotton grains, cotton seed cake, molasses, groundnut cake and other agro-industrial by-products that must be trucked into Seguenega, principally from Bobo-Dioulasso. As the demand for agro-industrial by-products in the southwest of Upper Volta increases in the medium to long term, it is questionable whether producers in Seguenega will be able to pay the higher cost of feed. This is a researchable question, but at the present cost of feed delivered to Seguenega (22 F.CFA/kg. for molasses), it is unlikely that supplemental feeding will be economically viable in the medium run, except for the finishing of limited numbers of rams for Tabaski.

B. Poultry Production

The FAC is presently funding the Project de Developpement Aviculture Villageoise in three departments of The Mossi Plateau (Yatenga, Kaya, Ouagadougou). The FAC approach to improving poultry production is similar to the FED approach to improving small ruminant production in that the initial and primary emphasis has been placed on vaccinating fowl and improving hygiene and housing. Paraveterinarians trained by the project administered 712,000 vaccinations against Newcastle's disease in 1982. The paravets also encourage producers to improve poultry housing by constructing larger and better aerated structures out of local materials. The FAC Project has not attempted to upgrade poultry feeding, since most producers are unwilling and unable to pay for the relatively high cost feed produced by the Centre Avicole of Ouagadougou and by AFAM (Ateliers de Fabrication d'Aliment du Betail), the feed mill in Bobo-Dioulasso operated by ONERA. Some grain is fed to poultry, but this is not practiced widely, due to the scarcity of grain during the peak period of production (rainy season). Finally, the FAC project has made no attempt to upgrade the genetic stock, arguing that breeding programs should be undertaken only after sanitation, housing, feeding and management have improved markedly.

The AFRICARE project in Seguenega has recently embraced a similar methodology in trying to upgrade poultry production. Exotic fowl were imported at the beginning of the project to upgrade the local stock, but high mortality and the high cost of maintaining an exotic flock at the livestock

station encouraged the project to adopt a different approach. Far more emphasis is now being placed on extension, particularly in the areas of poultry health and housing, which has had a positive effect on poultry production in Seguenega.

Both the FAC and AFRICARE interventions are modestly funded, and there is scope for intensification of efforts in the Mossi plateau and perhaps replication in other regions of Upper Volta. If USAID contemplates expanding the zones of coverage of the AFRICARE project, then care should be taken to collaborate closely with the FAC. Expanding poultry production would not create marketing problems in the medium term, since the demand for local breeds remains strong, as reflected in the premium that Voltaic chickens and guinea fowl command in the urban markets of Upper Volta and in the Ivory Coast. The apparent preference for traditionally raised fowl is unlikely to change in the medium run, even as production of broilers expands around Ouagadougou and in the Ivory Coast. An expansion in supply will probably not cause poultry prices to decline significantly in the short to medium run. Export prospects remain encouraging, particularly in Ivory Coast and perhaps in Togo, and urban demand for poultry in Upper Volta will continue to expand during the 1980's, as urban population and real incomes rise.

Rural consumption of poultry will likely increase as disease and sanitation problems are overcome. The FAC project staff, who have monitored the production and management of 40 flocks in 4 pilot villages of the Mossi plateau for two years, report that annual household consumption has increased from 1.0 kilograms to 2.4-3.0 kilograms per capita in as the incidence of Newcastle's disease has been greatly reduced. Households raise poultry primarily to be sacrificed and to meet immediate cash needs under unimproved management. Yet there is no resistance to consuming more poultry in rural areas, provided production is expanded and the customary uses of poultry continue to be satisfied. If poultry production were to double or triple in the long term as a result of improved health and hygiene, prices would decline somewhat, but this would not necessarily have a negative effect. Poultry could substitute increasingly for red meat in both rural and urban areas. Egg production and consumption could also expand dramatically. Moreover, Voltaic chickens and guinea fowl would continue to be competitively priced in the coastal markets.

C. Commercial Production of Broilers

While the medium term prospects for smallholder poultry production are encouraging, there is probably far less scope for expanding industrial production of broilers. Marketing opportunities for improved poultry breeds will probably be quite limited in the short to medium term (at least until 1990), given the reported preference for local breeds. Voltaic consumers claim that the meat of the indigenous fowl is tastier and more suitable to customary cooking practices than the meat of improved stock. Consumer resistance to industrially produced broilers is substantially less among

the urban upper classes and expatriate consumers, and their per capita poultry consumption is estimated to be far higher (6-10kg./yr) than for other consumers in Upper Volta (1-3.5 kg./yr.). Yet this group of consumers constitutes only about 10% of the urban population (+/-50,000 people), so there is limited scope for promoting industrial production.¹⁹ Feed costs are also high (55-85 F.CFA/kg.) and unlikely to decline in the near term. Moreover, Upper Volta is a grain deficit country during most years, and cereal prices are too high for intensive poultry production.²⁰ Finally, modern poultry production demands a far higher level of management than required for unimproved production schemes. There are few individuals capable of managing intensive broiler production units in Upper Volta at present, although this may change in the future. USAID might consider providing partial financing, technical assistance and training for a limited number of privately managed poultry production units. Such assistance should be at most modest pilot interventions, which would require careful monitoring of production costs, poultry growth performance and mortality, prices for broilers and unimproved stock, and consumer acceptance of the improved breeds.

The FAO and the World Bank have expressed interest in financing the construction of at least one medium size poultry abattoir. One slaughter facility would probably be situated at the ONERA abattoir and cold storage complex outside Ouagadougou, while others might be constructed at Bobo-Dioulasso, Fada N'Gourma, Kaya or Kondougou. There is disagreement over the optimal size of such slaughter units, reflecting differing assumptions of the potential demand for chilled poultry in the urban markets of Upper Volta and Ivory Coast.²¹ Clearly, a thorough analysis of the potential market for different poultry products (live vs. slaughtered fowl, unimproved vs. improved breeds) needs to be undertaken before any investments are made.

Furthermore, the channels for marketing slaughtered and chilled fowl need to be carefully identified. ONERA already operates a cold storage unit at the Ouagadougou slaughterhouse, a fleet of refrigerated trucks and two refrigerated containers for rail transport, all of which are underutilized at present. Yet the financial performance of this parastatal has not been impressive since its creation in 1976, due to high fixed costs (office building, refrigerated transport, abattoirs and cold storage) and far higher overhead per product unit than the private sector. In addition to ONERA, several fish wholesalers in Ouagadougou regularly truck ocean mackerel from Abidjan to Ouagadougou in refrigerated vehicles.²² These firms could be approached regarding transport of chilled poultry to Abidjan. Several wholesale butcher-exporters also have cold storage units and ship beef and small ruminant meat to Abidjan via privately owned refrigerated containers (that are transported on railway flat cars). Finally, UVOCAM operates cold storage units in Ouagadougou that are presently underutilized. Although several private firms, ONERA or UVOCAM might be willing to cold store and transport poultry to the coast, a thorough analysis of the potential market for poultry

products must be conducted before export of chilled poultry is promoted. The GOUV might be tempted to grant ONERA a monopoly on marketing of chilled poultry (through executive decree, subsidies, export tax breaks, etc.). It is better to encourage the private sector, which has proven capable of operating on lower margins than parastatal marketing institutions in Upper Volta.

D. Commercial Production of Eggs

While donor attention has focussed on broiler production and export of slaughtered fowl to coastal markets, there may be greater scope for promoting commercial egg production in Upper Volta in the medium to long term. Although there is no empirical evidence from Upper Volta to support the following statement, it is probable that the income elasticity of demand for eggs is high, increasing over the ranges of per capita income characterizing Upper Volta.²³ While some writers argue that traditional taboos severely constrain egg consumption, particularly in rural areas, this phenomenon has been exaggerated and there are sound economic reasons for limited rural egg consumption.²⁴

It is far more likely that poultry producers hesitate to consume or sell eggs, because they do not want to draw down on their future capital stock. Egg production is concentrated during the hot season in flocks of local breeds and is far lower than under intensive production schemes.²⁵ Moreover, fowl cholera, Newcastle's disease and parasites are prevalent and exact high losses during different periods of the production cycle. Poultry producers can ill-afford, therefore, to consume eggs in light of such poor egg production and high chick mortality without suffering serious consequences.

While it is questionable whether Voltaic consumers are willing to pay high prices for commercially produced broilers, there is evidence that consumers are willing to pay high prices for eggs produced by local and imported breeds. The Centre Avicole sells eggs for 55-75 F.CFA apiece (or \$1.94-2.65 per dozen, where \$1.00=340 F.CFA). Air freighted eggs sell for as much as 800 F.CFA per half-dozen (or \$4.71 per dozen). Prices for eggs produced by the indigenous hens fluctuate greatly in response to the seasonality of the production cycle. During the period of highest production (the hot season months of April and May) three eggs can be purchased for 25 F.CFA at distances of 100 or more kilometers from Ouagadougou. As the capital is approached, prices rise from 50 F.CFA for three eggs some 50 kilometers from Ouaga to at least 25 F.CFA per egg in town. These eggs are markedly inferior to the eggs produced by imported layers in both size and quality. Conservation is poor or nonexistent, resulting in high rates of spoilage. Consumption of eggs, which was estimated to be 0.8 kg. per capita per year in Ouagadougou in 1980, could expand greatly if production increases resulted in lower egg prices.²⁶

As in the case of broilers, feed availability could severely constrain the development of commercial egg production in Upper Volta. While the Centre Avicole supplies

feed for 75 F.CFA/kg to private producers, the feed is inferior and leads to poor egg production. Feed prepared by AFAM is superior in quality, but it is not certain that this ONERA subsidiary could supply large quantities of feed to a growing poultry industry at low cost. The present ration costs 85 F.CFA/kg in Ouagadougou. The potentially higher returns to egg production might justify investments in commercial layer flocks, despite the high feed costs, provided management were satisfactory. This is an important precondition which could plague the development of commercial poultry production in Upper Volta during the remainder of the century. USAID might consider funding masters level training in poultry science for qualified Voltaics in the U.S., which could combine practical management training in the U.S. and in-field research and training in Upper Volta as partial fulfillment of degree requirements.

° Before any actions to promote commercial egg production are undertaken, however, a careful study of egg consumption among different socioeconomic groups in rural and urban areas in Upper Volta needs to be conducted. Some notion of the income elasticities of demand for eggs for different income strata would be useful in projecting potential demand and the consequent scope for expanding commercial egg production. Export prospects for any surplus eggs produced in Upper Volta are uncertain at present in light of vigorous efforts to promote commercial egg production in the Ivory Coast. In the medium to long term the largest potential markets for eggs produced in Upper Volta are urban areas such as Ouagadougou, Bobo-Dioulasso, Fada N'Gourma, and Koudougou.

V. Constraints and Opportunities in the Small Stock Sector

A. Constraints to Increasing Production and Marketing

1. Production Constraints

The most binding constraints to increasing production of small ruminants and poultry are seasonal shortages of feed and water, the prevalence of diseases and parasites, and the low level of management. Dry season scarcities of feed and water plague all livestock production in the Sahel, setting ceilings on regional carrying capacities. While producers feed small ruminants agricultural byproducts, surplus grain in good years and, in a very few instances, agro-industrial byproducts, feed is not often systematically stored for late dry season (February-April) and early rainy season (May-June) use. This reflects the generally low level of producer management. In unimproved production systems small ruminants and poultry scavenge for food and little or no effort is made to improve small stock housing and health. Production gains are low and mortality is high. The FAC financed poultry project and FED financed small ruminant project are attempting to alleviate constraints of small stock health, housing and management in pilot zones.

2. Marketing Constraints

Small stock marketing is presently constrained by lack of access to marketing credit, inadequate transport, an absence of other marketing infrastructure, and high levels of export taxation. Wholesale traders and exporters have little access to credit for buying or renting, trucks, acquisition of livestock, and payment of taxes, particularly export taxes. Although some small ruminant traders own and operate trucks, most small stock traders rent vehicles or space on vehicles or use the railway for export. In addition, few traders have the financial resources to invest in silos, wells and water storage units, shade structures and fencing. Since individual traders do not own railway cars or land near railheads, they have no incentive to invest in improvements in railcars or holding structures at railheads. Poultry cages are placed on the ground at the sides of railways prior to shipment and therefore stressed by exposure to the elements.

Transport of small stock takes place under less than optimal conditions, particularly over longer distances. Small ruminants are crammed into trucks and railcars which are often poorly ventilated, contributing to mortality during the hot dry season. Wooden artisanal cages for transporting poultry are overloaded to lessen transport costs and export tax burdens, which are calculated on a per cage basis, where it is assumed that each cage contains 70 poultry. It is not uncommon for traders to crowd 80-90 fowl per cage. Over long hauls this overcrowding can lead to high mortality (20-30% is typical). Undue stress and shrinkage affects poultry, diminishing the quality of the product that arrives in coastal markets. Poultry cages are stacked on top of another (4-5 cages high) on flatbed railcars or trucks. Ventilation is not always good, and access to feed and water is irregular. Watering cans are provided in the corners of each cage, but the overcrowding makes it difficult for all the poultry to obtain water. Attendants sprinkle feed in the cages, but not all the poultry are able to consume enough grain to avoid shrinkage. Sustained exposure to direct sunlight, wind, dust, and rain can stress poultry in the exposed cages.

The poor physical conditions of transport are exacerbated by delays at railheads, police checkpoints and customs posts, as officials attempt to supplement low salaries. Trucks are stopped at least six times along the Ouagadougou-Abidjan route. There are also delays at rail stations, reflecting in part the low priority accorded to livestock by the RAN.

High export taxes also constrain the volume of poultry and small ruminants that traders can export at any one time, since taxes are paid in cash at the time of export. A trader who ships 10 cages of poultry by rail must pay 44,394 FCFA to customs officials, while an exporter of 100 sheep and 100 goats has to pay 644,670 FCFA in export taxes. It is obvious that few individuals in Upper Volta have the cash on hand to pay the export taxes above and beyond the working capital required for buying small stock and paying transport costs.

3. Export Constraints

In addition to the high level of export taxes, exports are constrained by several other factors. First, increasing urban demand in Upper Volta may decrease the volume of exports over time, as predicted by the CILSS and Club Du Sahel. A second constraining factor could be shifts in consumer preferences, particularly for poultry. As commercial broiler production is promoted in coastal West African countries such as the Ivory Coast, and as Ivorien consumers increasingly accept the improved breeds, demand for live poultry imports will probably decline in coastal markets. Broiler production costs will decrease per unit over time (relative to the delivered price of imported poultry). Increasing urbanization in the coastal countries will also lead to greater female participation in the wage labor force, less time for food preparation, and a preference for convenience. Rather than spending hours slaughtering, skinning and preparing poultry in slow-cooking stews, many working women will opt for ready to cook, industrially produced poultry. This change in preferences has taken place in other parts of the world (South America, Asia) along with increasing urbanization.

A final constraining factor, which needs further examination, is the seasonality of export demand, particularly for sheep. Fifty-seven percent of recorded exports of small ruminants from Upper Volta were sheep over the period 1978-1981, and many of these sheep were exported during the two months preceding Tabaski. There may be little scope for expanding exports of sheep, given the limits of demand. Production of high quality Djallonke sheep is increasing in the Ivory Coast under ambitious sheep production schemes, which will enable the Ivory Coast to meet an increasing proportion of this demand. It is reported that goats are preferred for consumption during other periods of the year in coastal West African countries. Hence, there may be greater scope for increasing goat exports in the next decade. Yet the level of exports will depend in large part on the supply of goats available for export once expanding local needs are met in Upper Volta.

B. Opportunities for USAID Involvement

1. Support for Production Interventions

USAID should work closely with AFRICARE, the FED and the FAC in improving small ruminant health, sanitation and management in rural areas of the Mossi Plateau. These interventions are modestly funded but promising and worthy of further support. Both the FED and FAC projects will be expanded within the Mossi Plateau region and could benefit from USAID funding. The AFRICARE project, particularly its health and extension program, could be replicated in other areas of the Mossi Plateau.

2. Marketing Credit

Improved access to marketing credit would enable small stock wholesalers and exporters to acquire trucks, improve feed and water availability for trade stock, and increase access to working capital. Additional working capital would allow traders to increase purchases of trade stock, meet transport costs, and pay export taxes. USAID could provide credit to the Ouagadougou association of small ruminant traders for truck acquisition and rental, purchase and storage of feed, trade stock acquisition and payment of export taxes. Marketing credit could also be extended to AFRICARE, Six S (Se Servir de la Saison Seche en Savane et au Sahel) or other associations working with livestock producers.

3. Applied Research and Training

The FED and FAC projects are generating useful information about small ruminant and poultry health, nutrition, production and management. Yet there is need for further applied research on the economics of small stock production and marketing. Areas requiring further analysis and monitoring are: (1) returns to alternative small stock enterprises, (2) marketing costs and margins, (3) price and export trends, and (4) consumption of livestock products in domestic and export markets. Voltaic researchers and analysis need to be trained to improve the capability of the livestock service, ONERA and private firms to design, implement and monitor projects and economically viable marketing interventions.

The principal thrust of the USAID Agricultural Sector Development Support project is to improve the capability of the Ministry of Rural Development to plan, identify and organize interventions, and manage resources. USAID enjoys a comparative advantage in management, applied research and training. As part of the ASDS project, therefore, it is consistent to conduct applied research on small stock production and marketing. This should serve as an input into livestock sector planning and also improve the skills of analysts and policy-makers.

4. Infrastructural Improvements

Infrastructural investments could improve livestock transport and lower livestock mortality. The completion of the paved road from Yaco to Ouagadougou will lower transport costs, resulting in user savings that could have a positive impact on the marketing of livestock, vegetables and secondary crops. Reduced transport costs would probably augment marketings of small ruminants and poultry from the Mossi Plateau. User savings could benefit producers in the form of higher sale prices, especially if competition increased among buyers. Upgrading and improved maintenance of unpaved roads between Kaya and Ouagadougou, Kongoussi and Kaya, Ouahigouya and Koudougou and other major trade and export axes could increase the volume of livestock exports from the Mossi Plateau. Since the Mossi Plateau is more densely populated than most regions of West Africa, it is

likely that road improvements are more economically viable and justifiable than in less heavily populated zones.

Rail transport of small stock could also be vastly improved, which would lower livestock mortality and shrinkage. Construction of well-aerated sheds for holding poultry prior to loading at the railheads would greatly reduce pre-departure stress. Provision of livestock carrying cars with well-ventilated sides and canopies would also reduce stress on both small ruminants and poultry during rail transport. Finally, excessive delays in rail transport of livestock could be avoided, which would ensure that small stock arrive in better condition at terminal markets. Delays in transport is more of an institutional problem than an infrastructural one, and USAID could consider offering financial assistance to the RAN for infrastructural improvements only if far greater priority were given to transport of livestock. Alternatively, USAID could extend financial aid to the small ruminant traders' association (based in Ouagadougou), which could fund, at least in part, the conversion of flat cars to well-ventilated and covered livestock carrying cars. Poultry marketing is fragmented and there is no traders' association. Therefore, it is unlikely that poultry traders would pool resources and work cooperatively to construct holding sheds or convert railcars.

5. Policy

While infrastructural improvements would have a positive effect on small stock exports (to urban and foreign markets) from the Mossi plateau, a number of policy issues need to be addressed before USAID considers intervening in the livestock subsector. The export tax is probably the most obvious one, because it has had a negative effect on small ruminant exports in recent years, as shown in the official statistics and as reported by livestock traders. Since export taxes are an important source of revenue for the government of Upper Volta, it is unlikely that USAID or any other donor will be able to apply much leverage in this area.

The export tax on livestock is also designed to discourage exportation and reduce the upward pressure on red meat and poultry prices in Upper Volta, particularly in urban areas. Export taxes on live animals are significantly higher than those on red meat exports, which accords with the GOUV's policy objective of augmenting meat exports at the expense of live animal exports. While this policy is intended to enable Upper Volta to capture more of the gains from livestock product transformation (i.e., slaughtering), Staatz has convincingly demonstrated that exportation of red meat in place of live animals causes Upper Volta to forego foreign exchange²⁹ from sales of the fifth quarter in coastal markets. In addition, the financial performance of ONERA, which operates the slaughterhouses at Ouagadougou and Bobo-Dicoulasso and transports most of the chilled red meat to coastal markets in refrigerated trucks and rail containers, has not been encouraging to date.

Although USAID and other donors will probably be unable to negotiate removal or reduction of export taxes in the medium term, donors may have considerably greater leverage in defining ONERA's role in livestock marketing. ONERA can play a positive role in upgrading and maintaining infrastructure at livestock markets, along stocking routes, and at railheads. This parastatal organization could also facilitate the collection, analysis and flow of livestock production and marketing information to government agencies, interested donors, private producers and marketing agents. ONERA probably can not compete effectively with the private sector in marketing livestock and meat, since it must bear far higher fixed and operating costs than private traders. If USAID does decide to improve livestock marketing in Upper Volta, the future role of ONERA in the marketing system will need to be carefully delimited.

FOOTNOTES TO MAIN TEXT

1/ World Bank, Upper Volta: Livestock Subsector Review, Report No. 3306-UV, 1982. The 1977 small ruminant population estimate for the five ORDs inhabited principally by the Mossi is 1.658 million animals. Assuming an annual average growth rate of 3% for the small ruminant herd, the population in 1983 is 1.98 million head.

2/ This estimate is obtained by taking the Livestock Service's 1981 population estimate (see Statistiques, Service de l'Elevage) and assuming herd growth of 3% per annum from 1981 to 1983.

3/ The 1975 population census showed that 3.3 million people lived in the five predominantly Mossi ORDs, the natural rate of increase of the resident population was 1.72% per annum, and the average household size was 5.7 people. Assuming that the rate of growth of the resident population of the five ORDs in the Mossi Plateau is about 3.8 million in 1983, of which about 3.4 million is rural. Hence, there are some 67,700 household in the five ORDs, of which nearly 60,000 reside in rural areas.

4/ The Project Development Aviculture Villageoise has monitored poultry production and transactions in 40 flocks in four pilot villages over a two year period. It is presently analyzing the data and hopes to be able to make preliminary findings available sometime in 1983. Seasonal variation in poultry holdings are very marked, which can greatly affect estimates of poultry population. The poultry flock tends to be largest during the hot season (April-May) and during the period when feed is most abundant. The flock is typically smallest in March, after the concentration of sales and consumption during the November-February period and seasonally pronounced epidemics of Newcastle's disease (January-February).

5/ Average household size is again assumed to be 5.7 people, and 3.4 million people are assumed to reside in rural areas of the five ORDs corresponding roughly to the Mossi Plateau.

6/ Republique de Haute-Volta, Ministere du Developpement Rural, Projet de Developpement de l'Elevage des Petits Ruminants du Yatenga: Evaluation du Projet Actuel et Preparation d'une Deuxieme Phase, prepared by J. Coulomb, IEMVT, 1982.

7/ Personal communication, J.N. Marchand, Projet Development Aviculture Villageoise

8/ Traders report that sheep and goats are usually not fed during rail transport from Upper Volta to Ivory Coast, because feeding is alleged to increase mortality. Moreover, the hardy indigenous breeds can withstand nutritional and water stress for several days. The small ruminants are grazed and watered in the bush near the railheads until the traders are notified by the RAN of the likely departure time. At that point, herders drive the animals to the rail station for loading. In contrast, poultry are held in wooden cages alongside the tracks before departure, often for long hours with no protection from dust, the sun and rain. This practice heightens stress and induces higher mortality than if a covered and ventilated shed were used for holding the poultry prior to departure.

9/ The mortality estimate for small ruminants was obtained from interviews with small stock traders. The estimate of poultry mortality is taken from the FAO study Enquete sur les possibilities de production et de commercialisation de la volaille, Haute-Volta.

10/ No import figures were available from the Livestock Service for the period 1979-1982.

11/ Edible offals are assumed to weigh 15% of the small ruminant carcass.

12/ Herman and Makinen, Livestock and Meat Production, Marketing and Exports in Upper Volta, CRED, University of Michigan, 1980.

CILSS and Club du Sahel, Elements for Livestock Development Strategy in Sahel Countries, prepared by IEMVT, September 1980.

World Bank, Upper Volta: Livestock Subsector Review, November 1982.

13/ The assessed values were 10,000 F.CFA for sheep and 8,000 F.CFA for goats from 1975 to 1982 and the ad valorem tax rate was 22.23%. In 1982 the assessed values rose to 15,000 F.CFA for sheep and 13,000 F.CFA for goats, resulting in export taxes of 3,335 F.CFA per sheep and 2,890 F.CFA per goat.

14/ CILSS and Club and Sahel, Elements de Strategie du Developpement de l'Elevage dans les Pays Saheliens, prepared by IEMVT, 1980.

15 The dates of the Moslem holidays are fixed in accordance with an unadjusted lunar calendar. Ramadan and Tabaski shift forward ten days per year on the Gregorian calendar.

16 Without better data on poultry production and offtake parameters, this is speculation. The Projet Developpement Aviculture Villageoise has recorded increased rural consumption of poultry as a consequence of its vaccination campaign against Newcastle's disease in the Mossi Plateau, however.

17 Pallo Pierre (1981) reports consumer dissatisfaction with the condition and weight (650 grams) of the exported product. Only 1200 guinea fowl were slaughtered in an "artisanal" fashion for export.

18 Several possible sites are the Ouagadougou and Bobo-Dioulasso slaughterhouses, operated by ONERA, as well as towns such as Fada-N'Gourma and Koudougou. Each slaughter facility would probably require an investment of no more than \$100,000 (personal communication, Eugene Sinodinos, World Bank regional office, Abidjan).

19 See Gergely (FAO), Enquete sur les possibilites de production et de commercialisation de volaille, 1980. Gergely estimates that rural consumption of poultry is 1.0 kilograms per capita per annum while per capita consumption is 3.5 kilograms per year in peri-urban areas (secondary towns). Average per capita consumption is 6.0 kilograms in Ouagadougou and considerably higher for wealthier urban consumers.

20 The wholesale prices of millet and white sorghum were 80 F.CFA/kg and 75 F.CFA/kg respectively in February 1983 in Ouagadougou.

21 Gergely (1980) proposes that an abattoir with a slaughtering capacity of 300 poultry per hour or 876 metric tons per year be established at an estimated cost of 55 million F.CFA (\$160,000 in 1979-80 prices at an exchange rate of \$1.00=340 F.CFA). He envisions that this facility will process locally produced (unimproved) stock and will be managed by ONERA. Pallo Pierre (1981), who is presently pursuing graduate studies in poultry science at Georgia State University, argues that the demand for slaughtered fowl is limited to expatriates, upper class Voltaics, and institutional buyers (hotels, restaurants, the Army, schools and hospitals) in Upper Volta and Ivory Coast. He therefore recommends an investment of 20 million F.CFA for the establishment of an abattoir with far lower capacity (150-200 fowl per hour or 438-584 metric tons per year) than Gergely. According to Pallo Pierre's projections, this facility would satisfy 10% of the Voltaic export market, while the other 90% would be fulfilled by exports of live, traditionally raised poultry.

22 840 tons of poultry could be trucked per year to coastal markets, if four privately owned ten-ton refrigerated trucks and two of ONERA's refrigerated vehicles were to haul full loads of frozen poultry to Abidjan and Lome twice per month. Presently, some 3500-5000 tons of live poultry (expressed on a carcass weight basis) are exported from Upper Volta to Ivory Coast, Togo, and Niger per annum.

23 This is speculation on my part, which underscores the need for a well-designed baseline survey of consumption of livestock products. Such a survey should encompass different strata of income groups in urban and rural areas.

24 It is claimed, for example, that children who eat eggs will become thieves. This sort of folk wisdom is usually an irrationalization for not behaving in an economically rational manner. See Marvin Harris's Cows, Pigs, Wars, and Witches for an illuminating and readable explanation of the economic motives underlying seemingly irrational behavior in non-western societies.

25 During the months of April-June, guinea fowl typically lay 30-40 eggs each, only a few of which are hatched. Guinea fowl, which figure far less importantly in customary social practice than chickens, are produced primarily for sale by Voltaic farmers.

26 Gergely (FAO, 1981) estimated egg consumption to be 0.8 kg./capita in Ouagadougou in 1980.

27 Project staff on the, Projet de Developpement Aviculture Villageoise report that hens fed commercial feed prepared by the Centre Avicole produce fewer eggs than if fed some grain and allowed to forage. They claim that the AFAM ration is far better nutritionally balanced. The Centre Avicole has had difficulty procuring a steady supply of well-conserved ingredients, particularly grain, for feed preparation.

28 For example, masters degree candidates could undertake summer internships with American or Voltaic industrial poultry producers. Thesis research in poultry management in Upper Volta would provide degree candidates with excellent experience.

29 John Staatz, The Economics of Cattle and Meat Marketing In Ivory Coast, Monograph II, Livestock Production and Marketing in the Entente States of West Africa, CRED, Univ. of Michigan, 1979.

ANNEX 1

STATISTICAL ANNEX

Livestock subsector statistics for Upper Volta and the Mossi plateau region are not very accurate or reliable. The Livestock Service is generally understaffed, underfunded and preoccupied with animal health and production. There is a division of statistics in the central office of the Livestock Service in Ouagadougou, but this office does not collect any data. Instead, it tabulates statistics recorded by field staff, who are not always able to devote much time to data collection and analysis. As a result, there is a great need for improved data collection and analysis for livestock subsector planning and project monitoring purposes.

The data herein are therefore tentative and suggestive rather than definitive. They are presented in order to suggest rough orders of magnitude and general trends for the livestock population, urban livestock slaughter, and livestock exports. It is difficult to know what margin of error to assign to these data. In the case of urban slaughter and exports, the data are most certainly underestimated, as the Livestock Service controls only a small fraction of urban slaughter of small ruminants and an unknown volume of exports goes unrecorded.

TABLE 3

LIVESTOCK POPULATION OF UPPER VOLTA, 1981

| Species | No. Head | Livestock Unit Conversion Factors | Livestock Units | % Total Livestock Units |
|----------|---------------|--|--------------------|-------------------------------|
| Cattle | 2,815,000 | 0.8 | 2,252,000 | 80.0 |
| Sheep | 1,904,000 | 0.1 | 190,400 | 6.8 |
| Goats | 2,876,000 | 0.1 | 287,600 | 10.2 |
| Pigs | 226,000 | 0.2 | 45,200 | 1.6 |
| Donkeys | 200,000 | 0.8 | 160,000 | 5.7 |
| Horses | 70,000 | 1.0 | 70,000 | 2.5 |
| Camels | 6,000 | 1.1 | 6,600 | 0.2 |
| Chickens | 12-25 million | | -- | |
| | | | 2,814,800 | |

Sources: Statistiques, Service de l'Elevage; G. Williamson and W. J. A. Payne, An Introduction to Animal Husbandry in the Tropics, Third Edition, Longman Group Ltd., London, 1977.

TABLE 4

RECORDED SMALL RUMINANT EXPORTS BY COUNTRY OF DESTINATION, 1960-1981

| Year | <u>Destination</u> | | | | | | | | Total Number Exported |
|------|--------------------|---------------------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|--------------------------|
| | <u>Ivory Coast</u> | | <u>Ghana</u> | | <u>Togo</u> | | <u>Benin</u> | | |
| | Number of Head | Percent of Total | Number of Head | Percent of Total | Number of Head | Percent of Total | Number of Head | Percent of Total | |
| 1960 | 30,863 | 15 | 173,556 | 85 | 23* | -- | -- | -- | 204,442 |
| 1961 | 34,855 | 16 | 187,068 | 84 | 1,071* | -- | -- | -- | 222,994 |
| 1962 | 74,356 | 30 | 175,556 | 70 | 841* | -- | -- | -- | 250,753 |
| 1963 | 120,816 | 45 | 145,177 | 55 | 572* | -- | -- | -- | 267,565 |
| 1964 | 156,931 | 68 | 68,815 | 30 | 6,333* | 3* | -- | -- | 232,079 |
| 1965 | 225,443 | 77 | 62,038 | 21 | 5,690* | 2* | -- | -- | 293,171 |
| 1966 | 153,019 | 77 | 42,812 | 22 | 2,789* | 1* | -- | -- | 198,620 |
| 1967 | 206,079 | 79 | 48,961 | 19 | 4,282* | 2* | -- | -- | 259,322 |
| 1968 | 250,019 | 86 | 37,666 | 13 | 4,586* | 2* | -- | -- | 292,271 |
| 1969 | 174,526 | 80 | 38,231 | 17 | 4,387 | 3* | -- | -- | 219,126 |
| 1970 | 191,563 | 82 | 36,363 | 16 | 3,218 | 1 | 2,081 | 1 | 233,225 |
| 1971 | 191,382 | 80 | 40,755 | 17 | 4,387 | 2 | 1,452 | 1 | 237,976 |
| 1972 | 265,798 | 95 | 8,202 | 3 | 3,626 | 1 | 2,141 | 1 | 279,767 |
| 1973 | 276,644 | 92 | 19,812 | 6 | 4,001 | 1 | 1,353 | -- | 301,810 |
| 1974 | 241,511 | 88 | 25,296 | 9 | 6,362 | 2 | 430 | -- | 273,599 |
| 1975 | 286,864 | 95 | 11,437 | 4 | 3,776 | 1 | 478 | -- | 302,555 |
| 1976 | 156,327 | 88 | 18,287 | 10 | 2,855 | 2 | 262 | -- | 177,731 |
| 1977 | 123,263 | 85 | 18,063 | 13 | 3,047 | 2 | -- | -- | 144,373 |
| 1978 | 180,396 | 91 | 9,194 | 5 | 8,049 | 4 | -- | -- | 197,819 |
| 1979 | 193,591 | 89 | 9,010 | 4 | 13,658 | 6 | 454 | -- | 216,715 |
| 1980 | 196,776 | 94 | 3,053 | 1 | 8,910 | 4 | 128 | -- | 208,997 |
| 1981 | 135,373 | 85 | 3,190 | 2 | 13,058 | 8 | 5,243 | 3 | 158,935 |

Sources: Statistiques du Service de l'Elevage, 1978-1981, and as reported in Herman and Makinen, Livestock and Meat Production, Marketing and Exports in Upper Volta, in Livestock and Meat Marketing in West Africa, Vol. I, CRED Univ. of Michigan, 1980.

*Includes exports to Benin.

TABLE 5

RECORDED EXPORTS OF SHEEP FROM UPPER VOLTA BY COUNTRY OF DESTINATION, 1970-1981

| Year | <u>Destination</u> | | | | | | | | Total Number Exported |
|------|--------------------|---------------------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|--------------------------|
| | <u>Ivory Coast</u> | | <u>Ghana</u> | | <u>Togo</u> | | <u>Benin</u> | | |
| | Number of Head | Percent of Total | Number of Head | Percent of Total | Number of Head | Percent of Total | Number of Head | Percent of Total | |
| 1970 | 137,137 | 92.1 | 9,604 | 6.5 | 1,267 | 0.9 | 831 | 0.6 | 148,839 |
| 1971 | 135,284 | 89.0 | 13,821 | 9.1 | 1,995 | 1.3 | 903 | 0.9 | 152,003 |
| 1972 | 183,746 | 96.8 | 2,434 | 1.3 | 2,250 | 1.2 | 1,398 | 0.7 | 189,828 |
| 1973 | 185,574 | 93.0 | 10,025 | 5.0 | 2,823 | 1.4 | 964 | 0.5 | 199,386 |
| 1974 | 166,929 | 91.5 | 11,985 | 6.6 | 3,262 | 1.8 | 355 | 0.2 | 182,531 |
| 1975 | 191,442 | 95.3 | 7,215 | 3.6 | 1,914 | 1.0 | 387 | 0.2 | 200,958 |
| 1976 | 89,642 | 89.9 | 8,297 | 8.3 | 1,718 | 1.7 | 16 | -- | 99,673 |
| 1977 | 62,214 | 81.5 | 12,823 | 16.8 | 1,275 | 1.7 | -- | -- | 76,312 |
| 1978 | 103,217 | 90.6 | 7,050 | 6.2 | 3,618 | 3.2 | -- | -- | 113,947 |
| 1979 | 111,902 | 91.6 | 4,060 | 3.3 | 6,173 | 5.1 | 77 | 0.1 | 122,212 |
| 1980 | 116,045 | 95.5 | 2,220 | 1.8 | 3,170 | 2.6 | 40 | -- | 121,481 |
| 1981 | 80,231 | 90.2 | 3,189 | 3.6 | 4,440 | 5.0 | 667 | 0.8 | 88,907 |

Sources: Statistiques du Service de l'Elevage, and as reported in Herman and Makinen, Livestock and Meat Production Marketing and Exports in Upper Volta, in Livestock and Meat Marketing in West Africa, Vol. I, CRED, Univ. of Michigan, 1980.

TABLE 6

RECORDED EXPORTS OF GOATS FROM UPPER VOLTA BY COUNTRY OF DESTINATION, 1970-81

| Year | <u>Destination</u> | | | | | | | | Total Number Exported |
|------|--------------------|---------------------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|-----------------------------|
| | <u>Ivory Coast</u> | | <u>Ghana</u> | | <u>Togo</u> | | <u>Benin</u> | | |
| | Number of Head | Percent of Total | Number of Head | Percent of Total | Number of Head | Percent of Total | Number of Head | Percent of Total | |
| 1970 | 54,426 | 64.5 | 26,759 | 31.7 | 1,951 | 2.3 | 1,250 | 1.5 | 84,386 |
| 1971 | 56,098 | 65.3 | 26,934 | 31.3 | 2,392 | 2.8 | 549 | 0.6 | 85,973 |
| 1972 | 82,052 | 91.2 | 5,768 | 6.4 | 1,376 | 1.5 | 743 | 0.8 | 89,939 |
| 1973 | 91,070 | 90.7 | 7,787 | 7.8 | 1,178 | 1.2 | 389 | 0.4 | 100,424 |
| 1974 | 74,582 | 81.9 | 13,311 | 14.6 | 3,100 | 3.4 | 75 | 0.1 | 91,068 |
| 1975 | 95,422 | 93.9 | 4,222 | 4.2 | 1,862 | 1.8 | 91 | 0.1 | 101,597 |
| 1976 | 66,685 | 85.4 | 9,990 | 12.8 | 1,137 | 1.5 | 246 | 0.3 | 78,058 |
| 1977 | 61,049 | 89.8 | 5,240 | 7.7 | 1,772 | 2.6 | -- | -- | 68,061 |
| 1978 | 77,179 | 92.0 | 2,144 | 2.6 | 4,431 | 5.3 | -- | -- | 83,872 |
| 1979 | 81,689 | 86.4 | 4,950 | 5.2 | 7,485 | 7.9 | 377 | 0.4 | 94,503 |
| 1980 | 80,731 | 92.2 | 833 | 1.0 | 5,740 | 6.6 | 88 | 0.1 | 87,516 |
| 1981 | 55,142 | 78.7 | 1 | - | 8,618 | 12.3 | 4,576 | 6.5 | 70,028 |

Sources: Statistiques du Service de l'Elevage, and as reported in Herman and Makinen, Livestock and Meat Production, Marketing and Exports in Upper Volta, in Livestock and Meat Marketing in West Africa, Vol. I, CRED. Univ. of Michigan, 1980

TABLE 7

SMALL RUMINANT MEAT EXPORTS FROM OUAGADOUGOU, 1967-1981 (in metric tons)

| Year | Sheep | Goat | Total | Percent of Total Meat from Ouagadougou | Percent of ^a Total Small Ruminant Meat Exports from Upper Volta |
|------|-------|------|-------|---|---|
| 1967 | 96.0 | 7.8 | 103.8 | 13.7 | 38.4 |
| 1968 | 44.8 | 2.6 | 47.4 | 4.3 | 23.3 |
| 1969 | 51.0 | 1.8 | 52.8 | 5.1 | 43.8 |
| 1970 | 41.8 | 4.7 | 46.5 | 5.5 | 39.5 |
| 1971 | 40.9 | 4.3 | 45.2 | 6.0 | 32.2 |
| 1972 | 46.7 | 4.4 | 51.1 | 9.0 | 52.1 |
| 1973 | 36.0 | 7.4 | 43.4 | 6.1 | 85.8 |
| 1974 | 47.2 | 3.4 | 50.6 | 8.7 | 78.4 |
| 1975 | 13.4 | 1.3 | 14.7 | 4.5 | 58.8 |
| 1976 | 1.7 | -- | 1.7 | 1.3 | 13.8 |
| 1977 | 2.1 | 0.1 | 2.2 | 1.9 | 21.2 |
| 1978 | 11.0 | 0.4 | 11.4 | 4.5 | 80.9 |
| 1979 | 10.2 | - | 10.2 | 1.7 | 100.0 |
| 1980 | 20.5 | - | 20.5 | 5.8 | 100.0 |
| 1981 | 125.0 | 1.5 | 126.5 | 17.3 | 100.0 |

Source: Statistiques du Service de l'Elevage, 1978-1981, and as reported in Herman Makinen, Livestock and Meat Production, Marketing and Exports in Upper Volta, in Livestock and Meat Marketing in West Africa, Vol. I, CRED, Univ. of Michigan, 1980.

^a Mutton and goat meat are also exported from Bobo-Dioulasso.

TABLE 8

MONTHLY EXPORTS OF SMALL RUMINANTS (SR in No. of Head) AND POULTRY (in Metric tons ¹) FROM THE OUAGADOUGOU AND KOUDOUGOU RAILHEADS, 1979-1982

| 1979 | | 1980 | | 1981 | | 1982 | |
|---------|---------|---------|---------|--------|---------|--------|---------|
| SR | Poultry | SR | Poultry | SR | Poultry | SR | Poultry |
| 6,922 | 133 | 12,872 | 123 | 6,645 | 133 | 8,215 | 90 |
| 7,438 | 87 | 9,335 | 109 | 7,287 | 33 | 4,577 | 73 |
| 5,588 | 92 | 8,914 | 96 | 5,947 | 71 | 5,028 | 81 |
| 5,333 | 91 | 7,666 | 121 | 5,155 | 208 | 5,738 | 87 |
| 3,552 | 79 | 6,652 | 116 | 2,024 | 85 | 2,119 | 62 |
| 2,542 | 63 | 4,006 | 50 | 2,462 | 86 | 1,490 | 57 |
| 5,203 | 80 | 4,580 | 109 | 1,972 | 76 | 2,502 | 71 |
| 8,545 | 103 | 7,137 | 94 | 3,400 | 69 | 1,934 | 65 |
| 6,696 | 76 | 5,663 | 105 | 8,577 | 45 | 35,422 | 126 |
| 12,853 | 118 | 30,765 | 104 | 19,575 | 66 | 2,849 | 80 |
| 5,475 | 97 | 7,726 | 81 | 4,967 | 38 | 4,320 | 87 |
| 12,695 | 241 | 13,602 | 223 | 14,702 | 71 | 9,698 | 211 |
| 102,842 | 1,260 | 118,918 | 1,331 | 82,713 | 981 | 83,892 | 1,093 |

¹ The RAN (Regie Abidjan-Niger) and the Customs Office at the railheads assume that the wooden cages in which the poultry are transported contain 70 chicken/guinea fowl per cage and that the fowl weigh an average of one kilogram each. Since the export tax is levied per cage, exporters have an incentive to cram as much fowl as possible into each cage. It is common for cages to contain 85-90 fowl each, which implies that the figures for poultry are underestimated by roughly 20%.

TABLE 9

RECORDED SMALL RUMINANT IMPORTS INTO IVORY COAST BY EXPORTING COUNTRY, 1974-1981

| | UPPER VOLTA | | MALI | | Total |
|------|-------------|--------|-------------|--------|---------|
| | No. of Head | %Total | No. of Head | %Total | |
| 1974 | 187,804 | 49 | n.a. | n.a. | 385,830 |
| 1975 | 253,517 | 72 | n.a. | n.a. | 352,642 |
| 1976 | 167,298 | 56 | n.a. | n.a. | 300,305 |
| 1977 | 164,016 | 59 | 10,854 | 4 | 277,719 |
| 1978 | 154,282 | 50 | 152,678 | 49 | 309,284 |
| 1979 | 150,639 | 38 | 238,447 | 60 | 398,507 |
| 1980 | 170,000 | 56 | 120,000 | 39 | 303,944 |
| 1981 | 214,932 | 52 | 185,986 | 61 | 414,732 |

Sources: Republique de la Cote d'Ivoire, Ministere de la Production Animale, as reported in Herman and Makinen, Livestock and Meat Production, Marketing and Exports in Upper Volta, 1980.

Douti Mankeboueb, C.E.B.V., "Etude sur la structure des prix de la viande sur l'axe Ouagadougou-Abidjan," 1982.

NOTE: n.a. indicates that that data (for Mali) are not available.

TABLE 10

RECORDED SLAUGHTER IN UPPER VOLTA, 1974-1981

| | Sheep | Goats | Total Small Ruminants | Pigs | Cattle |
|------|---------|---------|-----------------------|--------|--------|
| 1974 | 58,431 | 177,630 | 236,061 | 12,982 | 72,682 |
| 1975 | 50,411 | 208,324 | 258,735 | 13,378 | 61,523 |
| 1976 | 61,242 | 269,259 | 330,501 | 16,703 | 72,116 |
| 1977 | 68,898 | 306,363 | 375,261 | 23,363 | 73,793 |
| 1978 | 98,270 | 327,815 | 426,085 | 20,295 | 83,301 |
| 1979 | 137,105 | 326,219 | 463,324 | 20,276 | 90,499 |
| 1980 | 122,316 | 292,500 | 414,816 | 18,996 | 88,999 |
| 1981 | 144,464 | 324,389 | 468,853 | 21,290 | 93,022 |

Source: Statistiques du Service de l'Elevage

Note: These figures include slaughter for export (of chilled red meat). Export of mutton and goat meats was less than 20.5 metric tons (or approximately 3000 animals) from 1975 to 1980, so recorded slaughter of small ruminants is barely affected. We estimate that 9000 small ruminants were slaughtered for export in 1974 and 18,000 in 1981. Hence, recorded slaughter of small stock for internal consumption was about 227,000 animals in 1974 and 451,000 in 1981.

TABLE 11

RECORDED MONTHLY SLAUGHTER OF SMALL RUMINANT AND CATTLE AT THE OUAGADOUGOU ABATTOIR, 1978-1982

| | 1982 | | 1981 | | 1980 | | 1979 | | 1978 | |
|-----------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| | SR | Cattle |
| January | 8,075 | 2,260 | 8,476 | 3,562 | 9,079 | 3,237 | 9,038 | 3,205 | 10,547 | 2,155 |
| February | 7,795 | 2,333 | 8,527 | 3,509 | 8,715 | 3,162 | 8,832 | 2,944 | 3,404 | 2,015 |
| March | 9,714 | 2,315 | 8,316 | 3,154 | 8,173 | 3,390 | 10,131 | 3,454 | 10,491 | 2,185 |
| April | 9,741 | 2,232 | 9,582 | 3,506 | 8,658 | 2,981 | 10,138 | 2,867 | 10,227 | 1,842 |
| May | 9,353 | 2,073 | 9,995 | 2,883 | 9,911 | 2,646 | 10,052 | 2,210 | 12,363 | 1,824 |
| June | 10,892 | 1,672 | 10,416 | 2,491 | 10,585 | 2,278 | 14,362 | 2,264 | 12,279 | 2,000 |
| July | 12,870 | 1,741 | 12,359 | 2,624 | 12,306 | 2,112 | 14,878 | 3,083 | 12,288 | 1,949 |
| August | 14,528 | 1,952 | 12,035 | 2,582 | 11,048 | 1,940 | 14,529 | 2,347 | 15,882 | 2,111 |
| September | 12,241 | 2,069 | 10,965 | 2,478 | 10,705 | 2,294 | 14,737 | 2,398 | 13,899 | 2,290 |
| October | 11,704 | 2,590 | 8,957 | 2,530 | 9,603 | 2,577 | 13,225 | 3,040 | 12,867 | 2,465 |
| November | 9,843 | 2,871 | 9,945 | 2,842 | 8,058 | 2,713 | 8,226 | 2,805 | 9,367 | 2,866 |
| December | 11,235 | 3,325 | 10,711 | 2,933 | 9,075 | 3,496 | 9,216 | 3,326 | 9,516 | 3,369 |
| TOTAL | 127,991 | 27,433 | 120,284 | 35,094 | 115,919 | 32,826 | 137,364 | 33,943 | 133,110 | 27,071 |

Source: Statistiques du Service de l'Elevage Abattoir de Ouagadougou

TABLE 12

SMALL RUMINANT PRODUCTION PARAMETERS FOR THE YATENGA O.R.D. (Ouahigouya)

| PARAMETER | SHEEP | | GOATS | |
|----------------------------------|------------|------------|-----------|------------|
| | MOSSI | PEUL | MOSSI | PEUL |
| Fecundity | | | | |
| 1979 | 70% | 81% | 78% | 75% |
| 1981 | 79.5% | 97.7% | 88.3% | 78.6% |
| Age at First Landing/ Kidding | 12-13 mos. | 14-15 mos. | 8-11 mos. | 12-15 mos. |
| Mortality | | | | |
| 1979 | 18.3% | 20.5% | -- | 13.9% |
| 1981 | 8.4% | 9.3% | 7.3% | 8.1% |
| Offtake (1980-81) | 36.2% | 26.2% | 39.9% | 27.9% |
| Herd Growth (1980-81) | -3.9% | 3.7% | -3.9% | -3.7% |

Source: Republique de Haute-Volta, Ministere de Developpement Rural,
Projet de Developpement de l'Elevage des Petits Ruminants:
Evaluation du Projet Actuel et Preparation d'une Deuxieme
Phase, prepared by J. Coulomb, IEMVT, 1982.

ANNEX 2

Preliminary Assessment of the Market for Voltaic Exports of Small Ruminants and Poultry in the Ivory Coast

A. Recent Macroeconomic Trends in Ivory Coast

Ivory Coast is often touted as the economic miracle of Francophone Africa. According to World Bank statistics per capita income increased at an annual average of 2.4% from 1960 to 1979, reaching an average of \$1040 in 1979. This impressive growth was due primarily to an infusion of European capital, diversification of export revenues, and large inflows of laborers from neighboring African countries such as Upper Volta and Ghana. No one really knows the non-Ivorien population of Ivory Coast, but it is well over one million.

The rapid growth of the 1970s continued into 1981 but was reversed with the onset of global recession and hence contracting demand for Ivorien exports. The effect of this conjuncture has been to slow expansion of livestock production, particularly industrial poultry production, and to reduce per capita consumption of some livestock products. Ministry of Animal Production projections of consumption, production and imports of different types of animal products for 1990, which are based on simple extrapolations of past trends, are therefore flawed. Nevertheless, it is likely that economic growth will pick up again when the industrial countries pull out of the prolonged recession. Growth in real income will continue to create opportunities for increasing livestock production and consumption in the Ivory Coast. The extent to which real income growth in Ivory Coast

outstrips real income increase in Upper Volta Sahelian countries will have an important effect on livestock trade flows from the Sahel to the coast. The disparity in income growth rates will affect relative prices, which will in turn affect the magnitude of Sahelian exports (despite increasing urbanization and population growth in the Sahel, which would tend to reduce exports, assuming relative prices remained unchanged). The magnitude of trade flows will also be influenced by the ability of the Ivory Coast to increase animal production. The government has launched ambitious programs to expand red meat and poultry production, which are discussed briefly below.

B. Production and Consumption of Poultry, Eggs and Small Ruminants in Ivory Coast

The Sahelian drought served as the greatest impetus for expansion of livestock production in the Ivory Coast. Prior to the early 1970s the Ivory Coast was able to import large numbers of cattle, sheep and goats on the hoof at relatively low prices from Upper Volta and Mali. The massive destocking and mortality induced by the drought led to greatly curtailed imports. Beef and small ruminant meat prices soared in the Ivory Coast, as demand continued to expand. As Staatz has documented, imports of far less expensive chilled and frozen beef and mutton from Argentina, Australia and the EC increased severalfold, coinciding with the bottoming out of international red meat prices in the mid to late 1970s. While the Ivory Coast was able to import chilled and frozen red meat to compensate for the shortfall of Sahelian imports during the mid 1970s, the government decided to reduce its dependence upon imports of Sahelian livestock. The Ministry of Animal Production elected to promote small stock production in the Ivory Coast, particularly poultry, sheep and pig production. Cattle production was accorded far lower priority because Ivory Coast lies largely within the tse-tse fly infested zone of West Africa.

Poultry production in the Ivory Coast increased 61% between 1975 and 1981, largely due to a three-fold expansion in intensive modern poultry raising (See Table 13). A doubling of the national broiler and layer flocks occurred between 1978 and 1980-81, as shown in Table 14. This enabled Ivorian producers to increase coverage of national consumption from 83.1% in 1975 to 93.4% in 1982. Per capita consumption rose from an estimated 1.9 kilograms in 1970 (see Table 15) to 2.2 kilograms in 1975 and 2.7 kilograms in 1980, representing a 47% increase over the ten year period. According to Ministry of Animal Production estimates, live poultry imports declined from roughly one-sixth of estimated consumption (16.6%) in 1975 to only slightly more than one-twentieth (5.2%) of estimated consumption in 1982. The Ivorian figures suggest a 44% decline in live poultry imports between 1975 and 1982, but there are large discrepancies between Voltaic export figures and Ivorian import data.

As the number of improved layers put into production expanded through 1980, egg production and consumption also increased. Consumption of eggs, estimated at 0.6 kilograms

per capita in 1975, nearly doubled by 1982 to 1.1 kilograms per capita. As shown in Table 16, consumption of poultry products differs markedly between urban and rural areas, reflecting differences in income and access to alternative sources of supply (e.g., Voltaic imports).

Most of the modern intensive poultry production is carried out by large-scale commercial units. There are about a dozen large-scale egg producers, located principally in southern Ivory Coast near the major population centers. Eggs are retailed for 25 FCFA per egg or 300 FCFA per dozen, which is competitive with U.S. prices. In contrast, broilers are expensive, retailing for as much as 2000 FCFA per kilogram which is five to ten times the broiler price in the U.S. It is estimated that about 60% of the poultry consumed in Ivory Coast is sold by small-scale retailers in African style markets, while the other 40% are sold by supermarkets. Markups at supermarkets are reported to be high (50-100%) and prices are consequently high (1800-2100 FCFA/kilogram).

Small ruminant numbers increased quite rapidly from 1975 to 1982 in Ivory Coast (38% over the entire period), attaining nearly 1.8 million or about 38% of the size of Upper Volta's small ruminant herd. The Ministry of Animal Production has promoted sheep production since 1975, choosing to neglect goats on the grounds that goats are more difficult to herd and cause greater crop damage than sheep. Ivorian consumers are also reported to prefer mutton to goat meat, which contrasts with preferences reported for coastal consumers in Benin and Togo.¹ The Ministry of Animal Production has sought to upgrade sheep production by encouraging supplemental feeding of agro-industrial by-products, establishment of pastures on fallow cropland, intensive as opposed to extensive husbandry, and artificial insemination. It is reported that nearly 60% of the sheep producers have adopted some or part of the improved sheep raising program. Vigorous extension efforts have been concentrated principally in the central zone. While sheep were rarely marketed before 1975, they are sold far more commonly in the 1980s. At current prices (600-800 FCFA/kilogram liveweight) few consumers can afford to buy much mutton. In fact, per capita consumption of small ruminant meat has ranged from 1.2 to 1.5 kilograms during the 1975-82 period, representing only 4% of total consumption of red meat, poultry products and fish². Nevertheless, demand for sheep is strong at Tabaski and, to a lesser extent, at Christian holidays.

As production of small ruminants has expanded (offtake increased 30% from 1975 through 1982), a greater proportion of total consumption (43%) is being met by local production. Imports of live sheep and goats and chilled small ruminant meat from Upper Volta, which represented 51% of total Ivorian consumption of small ruminant meat in 1975, 28-29% in 1979-1981.³ As in the case of poultry, part of this decline is due to decreased imports (total imports fell off 20% from 1981 to 1982). The Ministry of Animal Production forecasts that 60% of domestic needs will be met by local production by 1990 and 70% by the year 2000. An annual deficit of about 10,000 metric tons is anticipated from 1990 through the end of the century, which will be

filled by imports of live animals from Upper Volta and Mali, as well as chilled and frozen small ruminant meat from the Sahel, the EC, Australia and Argentina. The market share of Upper Volta will depend upon the prices of Mossi and Sahelian stock relative to prices of other stock and red meat imported into Ivory Coast.⁴

C. Likely Trends in Ivorien Consumption of Poultry Products and Small Ruminant Meat: Implications for Upper Volta

Ministry of Animal Production estimates of per capita consumption of red meat, poultry products, fish and dairy products are shown in Tables 15-17. If dairy products and game are excluded from global consumption estimates, consumption of red meat, poultry products and fish can be broken out in the following proportions for 1980: fish - 61%; beef - 21%; poultry - 8%; small ruminant meat - 4%; eggs - 3%; and pork - 3%. Poultry products and small ruminant meat comprise about 15% of consumption of livestock products (excluding dairy products and game).⁵ While per capita consumption of poultry and eggs increased from 2.2 kilograms in 1975 to 3.9 kilograms in 1981, further increases in consumption may be modest in the medium run. Consumption levels in 1982 were slightly lower than in 1981, due principally to the decline in economic growth. Estimates of the income elasticities of demand for poultry and eggs are lacking in Ivory Coast, but knowledgeable observers of the livestock sector believe that the Ivorien market for poultry products is nearly saturated. One Ministry of Animal Production official argues that there will continue to be imports of about 1500 metric tons of poultry from Upper Volta through 1990, as there continues to be strong demand for the traditionally raised, unimproved stock among certain social groups (lower class Ivoriens, Voltaics in Ivory Coast) and during festive occasions, when fowl are sacrificed.

There is some evidence that middle to upper class Ivoriens in urban areas have accepted improved breeds of industrially produced poultry. In many of these families both husband and wife work, and women can no longer afford to spend three to four hours per day preparing meals. The recipe for Ivorien chicken stew, which requires several hours of cooking the chicken in a type of vegetable soup, has been adapted to the improved breeds of poultry. Rather than cooking the chicken 3-4 hours and having the meat from the improved poultry dissolve in the soup, women cook the improved breeds for shorter periods so that the meat does not flake off. Pre-slaughtered and pre-dressed chicken is also preferred in many households, because time is saved in not having to slaughter and dress fowl purchased live. The extent to which consumer tastes and preferences are changing in the Ivory Coast is difficult to measure, but it appears that urban households are accepting industrially produced broilers. And according to population projections of the Ivory Coast government, the urban population (6.9 million) will exceed the rural population (5.6 million) by 1990. The population of Abidjan, which grew at an average annual rate of 10.5% from 1970 through 1980, will probably be at least four million by 1990. Rapid urbanization will continue to

have an important effect on consumer preferences. The prospects for imports of live chickens and guinea fowl from Upper Volta may not be that bright in the long run, particularly in urban areas, as a greater proportion of married women enter the labor force and have consequently less time for food preparation. As is already occurring, a certain premium will be placed on convenience and ease of preparation.

While consumption of small ruminant meat, particularly mutton, has been concentrated during Moslem and Christian holidays to date, there is probably scope for increasing per capita consumption during the 1980s and 1990s in the Ivory Coast. Without precise estimates of income elasticity of demand, costs of production, likely price trends and cross price elasticities of demand, it is risky to project future increases in consumption of mutton. Consumer preferences represent another unknown, as Ivoriens have not consumed large quantities of mutton in the past. Fattening experiments with Djallonke sheep have shown that it is possible to produce an animal weighing 25 kilograms in five months, and these sheep have sold for at least 800 FCFA per kilogram liveweight. Mutton typically retails for 600-700 FCFA per kilogram, while goat meat sells typically for only about half as much. This price differential reflects the relative abundance of goats and consumer preferences for mutton. High prices for mutton (relative to goat meat and beef) may constrain demand for mutton, assuming demand is relatively price elastic. If the Ministry of Animal Production is able to realize ambitious sheep production targets by 1990 and 2000, the relative price of mutton will probably decline, which could induce a substantial increase in consumption (depending upon cross price elasticities of demand).

Although precise information for projecting increases in consumption of small ruminant meat is lacking, the Ministry of Animal Production anticipates that Ivory Coast will produce 60% of total consumption of small ruminant meat by 1990. In 1982 domestic production represents 43% of total consumption. Meeting 60% of national needs by 1990 may seem somewhat utopian, but vigorous health and extension programs are underway for improving sheep production. As suggested earlier, the export prospects for Upper Volta will depend on its ability to supply high quality animals and carcasses at

competitive prices. Upgrading of production technologies in Ivory Coast should foster consumer acceptance of better fleshed small ruminant meat, which could put pressure on Upper Volta to improve production techniques (more fattening programs) and transport of export stock (which presently lose weight when shipped by truck and rail to the Ivory Coast). In the final analysis, possible changes in Ivorien consumer preferences and the price and quality of Voltaic small ruminant meat relative to Ivorien, Malian, European and Australian small ruminant meat will greatly influence the magnitude of Voltaic exports. Yet in the medium run, export prospects remain good for Voltaic sheep and goats.

Footnotes to Annex 2

¹ Officials at the CEBV from Togo and Benin claim that coastal consumers prefer goat meat to mutton. This may be due to the relative availabilities of goats and sheep, for goats are far more prevalent.

² Per capita consumption of small ruminant meat declined 20% between 1975 and 1982, but the largest decline took place between 1981 and 1982 during the conjuncture.

³ This comparison is made using Voltaic export and Ivorien import data (see Tables 4 and 9).

⁴ Voltaic traders of small ruminants report that Malian stock are sold at lower prices per unit of liveweight than Voltaic stock. Hence, the Voltaic traders must often wait for Malian sheep and goats to be sold in Abidjan before selling the higher priced Voltaic stock.

⁵ One Ministry of Animal Production estimate of game consumption for 1980 was 1.7 kilograms per capita.

TABLE 13

COUNTRY PRODUCTION, IMPORTS AND CONSUMPTION IN THE IVORY COAST, 1975 AND 1979-1982 (in metric tons)

| | PRODUCTION | | | Frozen | IMPORTS | | Total Consumption | % | |
|------|-------------|--------|--------|--------|---------|-------|----------------------|--------------|-------------------------|
| | Traditional | Modern | Total | | Live | Total | | Prod Cons | Live Imports Cons |
| 1975 | 11,500 | 2,000 | 13,500 | 50 | 2,700 | 2,750 | 16,250 | 83.1 | 16.6 |
| 1979 | 14,300 | 3,700 | 18,000 | 217 | 2,500 | 2,717 | 20,717 | 86.9 | 12.1 |
| 1980 | 14,800 | 5,700 | 20,500 | 256 | 2,000 | 2,256 | 22,756 | 90.1 | 8.8 |
| 1981 | 15,600 | 6,100 | 21,700 | 430 | 1,500 | 1,930 | 23,630 | 91.8 | 6.3 |
| 1982 | 15,200 | 6,400 | 21,600 | 335 | 1,200 | 1,535 | 23,135 | 93.4 | 5.2 |

Source: Unpublished data, Ministere de la Production Animale, Republique de la Cote d'Ivoire

NOTE: Imports of frozen chicken from the EC and the U.S. were banned in 1981. The figures for frozen imports of duck, turkey, pigeons and other fowl.

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TABLE 14

THOUSANDS OF BROILERS AND LAYERS IN INDUSTRIAL PRODUCTION, 1978-1981

| | BROILERS | INDEX | LAYERS | INDEX |
|------|-----------|-------|-----------|-------|
| 1978 | 1,984,000 | 100 | 559,000 | 100 |
| 1979 | 2,835,000 | 143 | 874,000 | 156 |
| 1980 | 3,669,000 | 185 | 1,266,000 | 226 |
| 1981 | 4,106,360 | 207 | 1,020,584 | 183 |

Source: Unpublished data, Ministère de la Production Animale, République de la Côte d'Ivoire

TABLE 15

ANIMAL PROTEIN BALANCE SHEET FOR THE IVORY COAST, 1970-1980:

| | 1970 | | 1980 | |
|-------------------------|----------------------|----------------------|----------------------|----------------------|
| | <u>Total Tonnage</u> | <u>Kg./Capita</u> | <u>Total Tonnage</u> | <u>Kg./Capita</u> |
| Population | 6,709,000 | | 8,262,000 | |
| I. CONSUMPTION | | | | |
| Cattle | 45,300 | 6.8 | 61,000 | 7.4 |
| Small Ruminants | 9,800 | 1.5 | 12,400 | 1.5 |
| Pigs | 5,200 | 0.8 | 8,600 | 1.0 |
| Total Red Meat | 60,300 | 9.1 | 82,000 | 9.9 |
| Poultry | 12,600 | 1.9 | 23,000 | 2.8 |
| Eggs | 2,500 | 0.4 | 9,700 | 1.2 |
| Total Poultry Product.: | 15,100 | 2.3 | 32,700 | 4.0 |
| Milk | 46,000 | 6.9 | 186,000 | 22.5 |
| Fish | <u>94,000</u> | <u>14.0</u> | <u>180,500</u> | <u>21.8</u> |
| Grand Total | 21,540 | 32.1 | 481,200 | 58.2 |
| II. PRODUCTION | | <u>Prod/cons (%)</u> | | <u>Prod/cons (%)</u> |
| Cattle | 5,200 | 11.5 | 12,300 | 20.2 |
| Small Ruminants | 3,500 | 35.7 | 4,400 | 35.5 |
| Pigs | 4,400 | 84.6 | 7,300 | 84.9 |
| Total Red Meat | 13,100 | 21.7 | 24,000 | 29.3 |
| Poultry | 10,100 | 80.2 | 20,000 | 87.0 |
| Eggs | 2,500 | 100.0 | 9,700 | 100.0 |
| Total Poultry Products | 12,600 | 83.4 | 29,700 | 90.8 |
| Milk | 4,000 | 8.7 | 10,000 | 53.8 |
| Fish | <u>74,000</u> | <u>78.7</u> | <u>85,920</u> | <u>47.6</u> |
| Grand Total | 103,700 | 48.1 | 149,620 | 47.7 |
| III IMPORTS | | | | |
| Cattle | 40,100 | | 48,700 | |
| Small Ruminants | 6,300 | | 8,000 | |
| Pigs | 800 | | 1,300 | |
| Total Red Meat | 47,200 | | 58,000 | |
| Poultry | 2,500 | | 3,000 | |
| Eggs | - | | - | |
| Total Poultry Products | 2,500 | | 3,000 | |
| Milk | 42,000 | | 176,000 | |
| Fish | <u>20,000</u> | | <u>110,500</u> | |
| Grand Total | 111,700 | | 347,500 | |

Source: Unpublished estimates, Ministry of Animal Production, Ivory Coast

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TABLE 16

ESTIMATED CONSUMPTION OF POULTRY PRODUCTS IN IVORY COAST, 1980 (Kilograms/Capita)

| | <u>FOWL</u> | <u>EGGS</u> | <u>POULTRY & EGGS</u> |
|------------------|-------------|-------------|---------------------------|
| Urban Areas | 3.4 | 2.0 | 5.4 |
| Rural Areas | 2.2 | 0.7 | 2.9 |
| National Average | 2.7 | 1.1 | 3.8 |

Source: Unpublished data, Ministere de la Production Animale, Republique de la Cote d'Ivoire

NOTE: The estimated urban population of Ivory Coast was 3.4 million in 1980, of which nearly 2.0 million reside in Abidjan. The remaining 4.9 million of the population of 8.3 million was classified as rural. Hence, about 40% of the population was urban and 60% rural.

TABLE 17

SMALL RUMINANT PRODUCTION, IMPORTS AND CONSUMPTION IN THE IVORY COAST, 1975 and 1979 - 1982

| | Herd Size ('000) | Offtake (Metric Tons) | Frozen Chilled Meat (Metric Tons) | Live Animals ('000) | Total (Metric tons) | Total Consumption (Metric tons) | Cons/ Capita (kg.) | Pro/ Cons (%) | Imports from Upper Volta Cons (%) |
|------|-------------------------|-----------------------------|---|----------------------------|---------------------------|---------------------------------------|--------------------------|---------------------|---|
| 1975 | 1188 | 3542 | 122 | 353 | 6178 | 9842 | 1.5 | 36.0 | 51.1 |
| 1979 | 1550 | 4263 | 93 | 398 | 6873 | 11549 | 1.5 | 36.9 | 28.6 |
| 1980 | 1620 | 4455 | 398 | 368 | 6351 | 11204 | 1.3 | 39.8 | 28.6 |
| 1981 | 1695 | 4412 | 446 | 407 | 7019 | 11877 | 1.4 | 37.1 | 27.6 |
| 1982 | 1775 | 4619 | 523 | 325 | 5606 | 10758 | 1.2 | 42.9 | |

Source: Unpublished data, Ministere de la Production Animale, Republique de la Cote d'Ivoire

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