

IMPROVING LIVESTOCK AND MEAT MARKETING IN THE THIRD WORLD

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## TABLE OF CONTENTS

	Page
ABSTRACT	iii
BACKGROUND	2
A. Developed Countries	5
1. United States	5
a. Packing in large cities	6
b. Decentralization	7
c. Development package	8
d. Effective demand	9
2. Other developed countries	11
B. Developing Countries	12
1. Marketing	13
2. Consumption	14
3. Examples of marketing development	15
4. Examples of marketing development problems	17
PROBLEMS IN THE THIRD WORLD	19
AFRICA - Nature of Subsector	22
A. Low Productivity	22
B. Small Stock to Increase	24
C. Small Stock Marketing	25
D. Marketing Policies	28
E. Marketing Efficiency	31
F. Marketing Pastoral Livestock	35
G. Summary	36
LATIN AMERICA - Nature of Subsector	37
A. Low Costs - Low Prices	38
B. Consumption	39
C. Livestock Marketing and Slaughter	42
D. Retail Markets	43

## TABLE OF CONTENTS - Continued

	Page
E. Marketing Policy	45
F. Summary	46
ASIA - Nature of Subsector	47
A. Marketing	48
B. Marketing for the Small Farmer	49
C. Future Changes	49
SUMMARY	50
RECOMMENDATIONS	51
A. What needs to be done	51
B. Marketing Improvements	51
RESEARCH PROGRAMS	54
REFERENCES	58
FIGURES	
Figure 1 Meat Consumption	4
Figure 2 International Trade Flow of All Meat, 1977	10
Figure 3 International Trade Flow of Beef, 1977	10
Figure 4 Contribution of Goats and Sheep to the Meat Supply of a Sahelian of Mali	23
Figure 5 Seasonal Variations in Females Lactating in Sudan	26
TABLES	
Table 1 Meat Price Statistics for Ghana and Tanzania	30
Table 2 Per Capita Meat and Egg Consumption Projections for 1985, by Region	40
Table 3 Average Retail Food Prices in Selected World Capitals, March 3, 1981	41

## ABSTRACT

## IMPROVING LIVESTOCK AND MEAT MARKETING IN THE THIRD WORLD

Few areas of the agricultural sector differ as much between developed and developing countries as the livestock-meat subsector. In the Third World it appears to lag development of the general economy and the agricultural sector. The evolution of the livestock-meat marketing in developed countries is summarized and related to Third World progress. Effective demand pulls the development of livestock-meat marketing as evidenced by the meat export industry utilizing more improved practices than the domestic oriented industry.

There is wide variability in the livestock-meat marketing development in the Third World. A rather common problem, however, is that price and/or export tax policies tend to hold domestic prices for meat and livestock below international levels, discouraging the use of improved practices. A list of research and development projects ranging from study of alternative price policies to specific feasibility of marketing facilities are outlined.

Change in the livestock-meat subsector in the developed countries has been evolutionary. There is no historical evidence that there will be a "meat revolution" to parallel the "green revolution" in the Third World. Some changes in infrastructure such as changes in price policy, market structure and market services can be made at relatively low cost and result in significant improvement in market performance.

11

## IMPROVING LIVESTOCK AND MEAT MARKETING IN THE THIRD WORLD\*

By Donald E. Farris\*\*

Few areas of agricultural marketing differ as much between developed and developing countries as the marketing of livestock and livestock products. Consumers selecting fresh meat in a modern supermarket self-service counter from among a wide variety of attractive transparent packages is a common occurrence in developed countries. The meat may be used immediately or kept in the refrigerator several days or frozen for use later. In many developing countries fresh meat often is purchased at an open stall in a central market having no refrigeration. The consumer's order is cut from a carcass that was slaughtered the night before and the product will be consumed that day. This kind of difference continues back through wholesaling, processing, marketing live animals and the production system.

Key innovations that modernized the meat marketing industries of the developed countries began with rail transportation, refrigeration, mechanized processing and specialization of enterprises.

In the developed countries, sanitary slaughter followed by refrigeration permits transporting long distance and temporary storage, if necessary, at all points in the marketing system. Refrigeration, coupled with rapid transportation, can maintain a continuous flow of fresh (or processed) meat to large population centers while maintaining the peak of quality. Effective demand as a result of higher income is necessary to support the level of quality and services prevailing in the developed countries. Improving marketing in

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developing countries that is consistent with a lower effective demand is clearly a greater challenge than most development professionals expected two or three decades ago. Perhaps the lack of progress is at least partially due to concentrating on improving production without simultaneously dealing with marketing and marketing policies. The experience of the last two decades makes it very clear. Progress in the livestock-meat subsectors of the Third World is very difficult and a long-run process. The pattern of progress at best will be evolutionary if the history of the developed countries is followed. There simply is no historical evidence that a meat revolution will parallel the "green revolution."

### Objective

The objective of this report is to assist the Agency for International Development, Bureau of Science and Technology (AID S&T/RD) in developing a program of research and technical assistance activities in the area of livestock and livestock products marketing to promote agricultural development in low-income countries.

More specifically, this paper will (1) Briefly describe the nature of livestock and meat marketing, including its progress as economies develop, (2) Identify key problems limiting development of the livestock-meat subsector in the Third World, and (3) Propose programs and research that would enhance the rate of development in Third World livestock-meat systems.

### BACKGROUND

Development of the livestock and meat subsectors in different parts of the world has progressed at vastly different rates. The path of development has been somewhat different; however, it has followed the same general

pattern, with some exceptions in the details, of course. Development has been pulled by great differences in effective demand, by the general level of development of the economy and by the level of development in agriculture in the country. Although the path of development has differed in detail the patterns of the developed countries have been similar as they adapt technology and management systems to special problems in their own livestock-meat subsectors.

Red meat is more palatable and is expensive relative to vegetable protein sources and as a result, effective per capita demand for meat generally increases with income (Figure 1). The relative price of meat compared to other foods also influences this rate of increase. Perhaps that explains why Latin America, Eastern Europe and Oceania points are to the left of the curve and East Asia is to the right in Figure 1. Oceania has relatively low priced meat and East Asia much higher prices.

Costs of production and marketing meat have been greatly influenced by developments outside of the subsector. The tremendous reduction in the cost of producing animal feeds since World War I have reduced the cost of production of meat, especially in the developed countries, and in some developing countries that are net exporters of agricultural products. Improvements in transportation, especially the declining cost of truck transportation since World War II, have reduced marketing costs substantially. The commercial meat industry accelerated with the advent of mechanical refrigeration. Improved communications also facilitate the development of livestock and meat marketing.

Some areas of the Third World have made significant advancements in livestock production and marketing such as Northern Mexico and the Pampas area

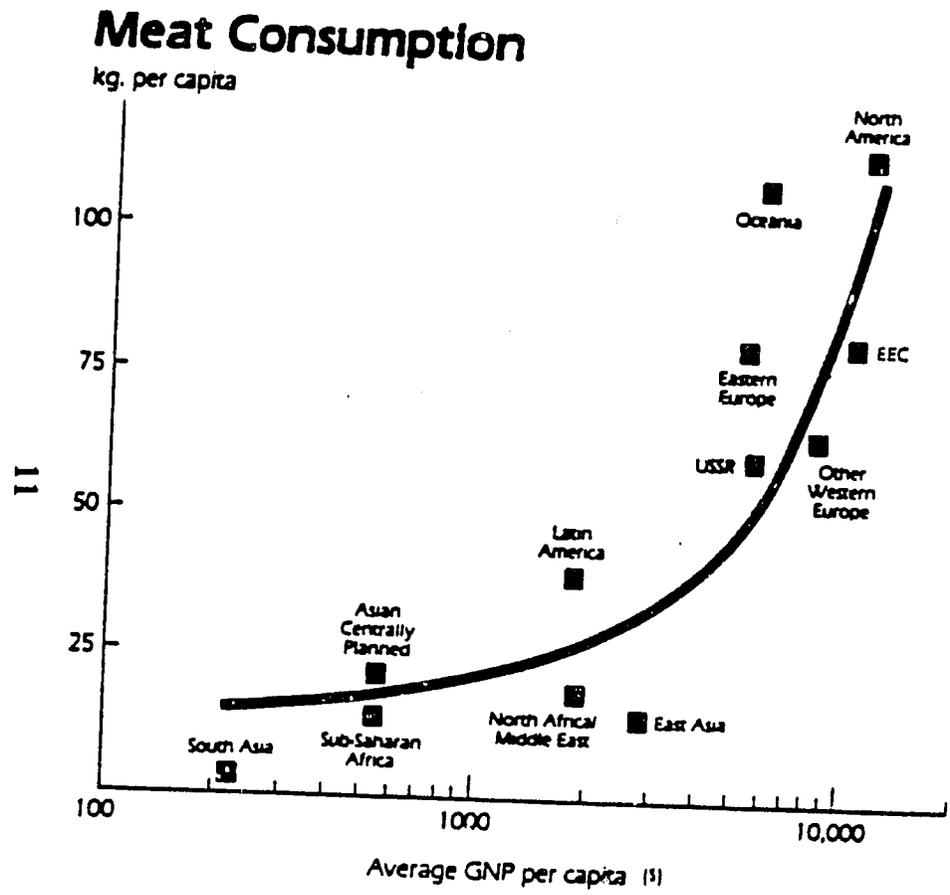


Figure 1

Source: Winrock International, "A Summary: World Agriculture - Review and Prospects into the 1990's."

of South America. The pastoral areas of Africa, on the other hand, have made only minor improvements, despite improved methods introduced by the colonialists. Overall, progress in the Third World is disappointing, however.

Crotty (p. 1) states, "The gap between the attainable and the attained, with existing pastoral resources and knowledge, is wider than in any other major enterprise. For example, annual output per head of cattle is 14 lb. of beef and 10 gal. of milk in the countries with the poorest one-third of the world's population; it is 140 lb. of beef and 140 gal. of milk in the countries with the the wealthiest one-third. [That is a difference of ten times!] The shortfall in respect to cropland is much less: yields of cereals and pulses in the poorest countries are two-thirds those of the wealthiest. Production of beef per head of population in the countries with the poorer half of the world's population, already low, is declining."

A comparable comparison of productivity in marketing is not available. However, it can be observed that the difference in the use of marketing methods and systems between developed and developing countries is as striking as are the differences in production.

#### DEVELOPED COUNTRIES

##### United States

Reviewing the evolution of the livestock-meat marketing development in the U.S.A. may provide some perspective as to what is involved in our own development. Progress in development began in the colonial period, but most of the modern industry has emerged since the 1900's. The first commercial meat packing plant was established in Boston in 1662, most likely producing only barrelled cured pork. Auction selling of livestock was reported as early as 1676. The Brighton Market, established near Boston in 1756 was the first public stockyard of record where all were invited to buy and sell.

Livestock were transported by canal boats, river barges and by steamboats. Over land, they were moved by trailing (trekking) to population centers where they were slaughtered by commercial packing plants or by individuals. The long Texas cattle drives began about 1842 — one to New Orleans and one to Missouri. In 1846 a herd was driven to Ohio for feeding and 1855 one was driven from Texas to New York City.

The development of the railroads resulted in a system where cattle were driven to the railroad then transported to the major cities for slaughter or to the Midwest or Northeast for feeding. Being a central railroad terminal in the Corn Belt made Chicago a logical meat packing center which produced pork to ship to the East. The first refrigerated car of dressed beef was made in 1877. The refrigeration was natural ice (Williams and Stout).

#### Packing in large cities

The focus of the meat industry marketing was the large cities in the Midwest and the Northeast. Practically all the rail centers had stockyards that were surrounded by packing plants. Meat products were shipped out of these centers by refrigerated rail cars. In the 1920's some local distribution was performed by trucks. The meat packing centers dominated meat marketing until after World War II when modern trucks facilitated movement of packing plants to cattle and hog fattening areas. This resulted in a sharp increase in direct sales of slaughter livestock to packers, bypassing the livestock terminal markets. In the meantime, country auction markets developed to handle the specialization taking place as more specialized cow-calf operations needed a local market where farmers could sell a few calves or a single cull cow at a time. By the 1950's the U.S. for the first time had as many beef cows as dairy cows and the cattle feedlot industry began to expand from the farmer-feeder lots of the Midwest to the large commercial

lots in California and later to the Southern Plains of Texas and Oklahoma. The meat packing industry had decentralized and specialized.

#### Decentralization

The flexibility of efficient refrigerated rail and truck transportation made it possible to deliver meat over long distances in a short time. This allowed slaughter plants to locate in the production areas where most of their supplies were within 100 or 200 miles of their plant. It is much more efficient to ship about 50 percent fewer pounds of meat long distances than livestock where there is a modern transportation system available.

In the 1980's, it appears the meat industry of the U.S.A. is mature - not that there are not more changes on the horizon - but the growth for the first time since the 1930's appears to have leveled off. At this point, there is a wide variety of methods and systems. There are still old plants operating in cities; and there are still small plants in rural areas slaughtering only a few head a week. The major portion of the business, however, is specialized large scale slaughter and processing plants in or near the production areas.

There is a mandatory national system of health and sanitation inspection. There are national grade standards for voluntary use by the industry, as well as a national market news and supply reporting system.

Most of the slaughter livestock are sold direct to packers, bypassing public markets where producers have truckload volumes to sell. All types of markets exist, including a few electronic markets for lamb and feeder cattle that handle only a small volume to date. Most of the cow-calf operators use local auction markets, some of the larger ones sell direct or through order buyers, however. The auction market appears to be an efficient method of exchange for small lots of livestock. Producers are aided by an innovation called the "gooseneck trailer". Since its invention a little more than 20

years ago it has become the preferred method of short distance hauling of livestock. Being close to the ground, it is easy to load and unload and is more stable at highway speeds.

#### Development package

The developments in technology such as transportation, refrigeration, mechanized slaughter, and modern supermarkets are all rather obvious conditions that support development in all the perishable food industries. The less obvious developments are the role played by a stable political and economic environment. Meat industries are capital intensive and require long range investments. Reliable government services such as market news, livestock and crop supply reports, and grades and standards facilitate the development of efficient pricing and buying and selling.

In the United States order buyers commonly take orders by phone from farmers who need a truckload of stockers to graze seasonal pastures like winter wheat in the Southern Plains or mountain valley summer pastures. They may in turn place this order by phone with one or more dealers at public markets. Both feeder and slaughter cattle are sold direct from producer to buyer by phone (although a relatively small portion of the total volume). This is made possible by mutual trust and supported by the knowledge that verbal contracts and agreements are enforceable by law. The Packers and Stockyards Administration of the U.S. Department of Agriculture has a prompt payment regulation that requires payment within 24 hours of purchase. Most of the U.S. truckload wholesale meat transactions are traded by phone and/or telex between buyer and seller. These trades often take place utilizing official USDA grades and within the buyer's standard buying specifications. They may relate to a standing contract that specifies the buyer's quality, trim and weight specifications, with prior agreement that price is determined

by a specific market quotation a few days later (the approximate delivery time).

These activities are extremely efficient marketing methods that rely on modern technology, but the system works because the industry organizations and the government cooperate to see that the necessary rules, regulations and services are available for a smoothly operating subsector.

Some of this technology has been and will continue to be transferred to the Third World (not necessarily without modification); but for it to result in the most effective development the necessary infrastructure, legal and economic framework and management must be there in a package. Furthermore, all of it is not necessarily cost reducing. Some of it is quality enhancing, quality maintenance, convenience and cost increasing. Effective demand to pay for this technology must also be in place. This does not mean that a U.S. type slaughter plant or feedlot would be appropriate for the least developed areas of Africa. On the contrary, smaller, lower cost plants with minimum facilities (and most likely without refrigeration) would be more appropriate.

#### Effective demand

To illustrate the key role of effective demand, the large affluent market of the U.S.A. is the largest beef producer and at the same time the largest beef importer in the world. Imports consist mainly of frozen boneless beef used mostly for grinding from Oceania and Central America. Australia depends on the U.S.A. for about 50 percent of its exports (Figures 2 and 3). When record beef supplies were being marketed in the U.S.A. and other areas of the world in 1975-77, the price of thin cattle in interior Australia dropped essentially to zero. The same was true of week-old bull dairy calves in the U.S. Cull cow prices in interior Tanzania would have been near zero because the international price would barely cover the cost of transport and

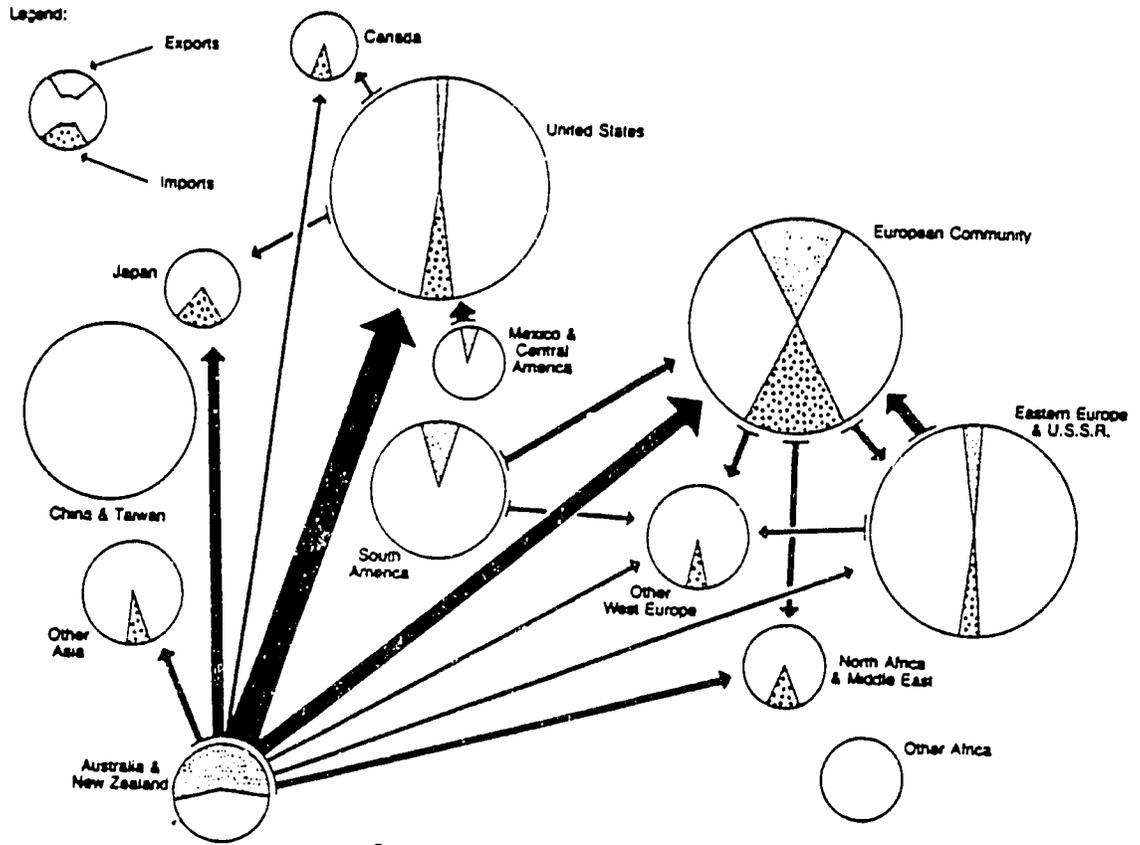


FIGURE 2 — Interregional Trade Flow of All Meat, 1977

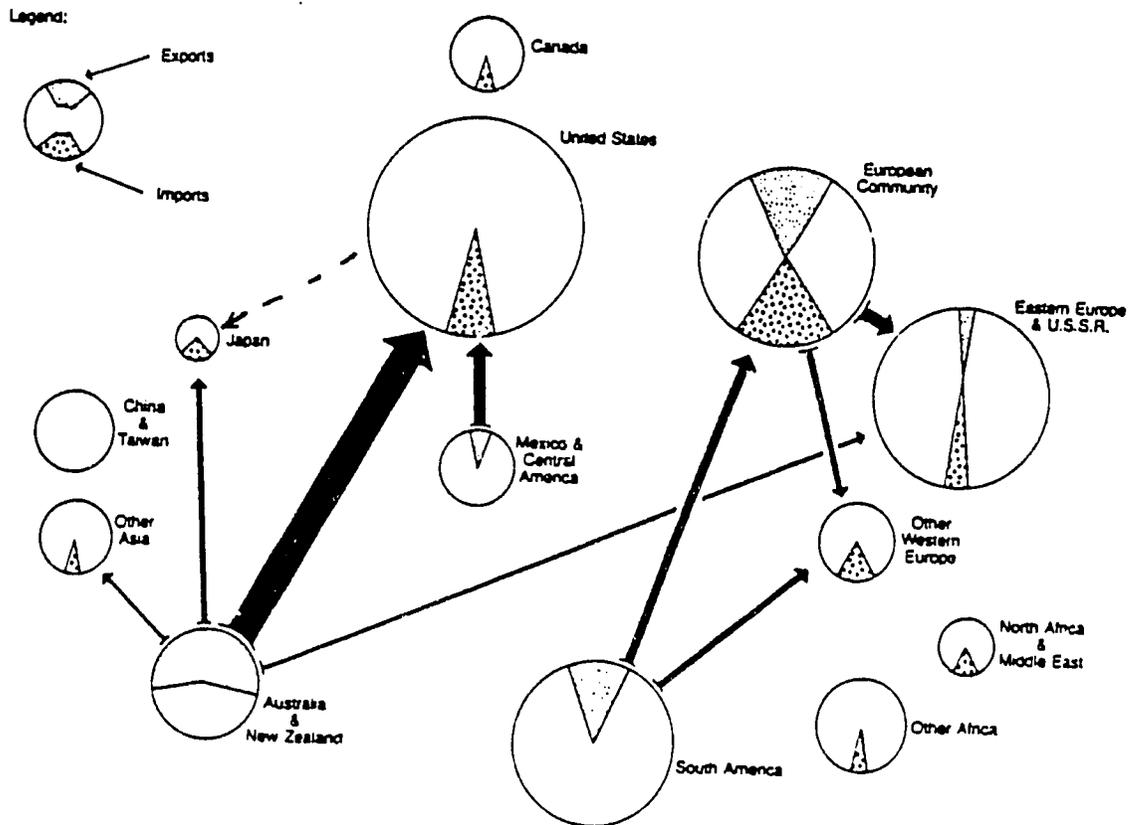


FIGURE 3 — Interregional Trade Flow of Beef, 1977



processing, however, the Tanzanian Government had established a minimum price.

The evolution of the United States livestock and meat subsector involves some phases found currently in many Third World countries. In the early stages of development, there was communal grazing and trekking cattle to market. As late as the 1930's there was still a hot meat trade and it was not uncommon for subsistence farmers to slaughter their own meat supply and sell the surplus to neighbors or local townspeople.

One trend that appears rather clear (but not easy to document), is that the Third World is still in the process of increasing the number of public markets and the percentage of livestock being sold through public markets; whereas, the developed countries have passed that phase and are increasing the percent of livestock sold direct to buyers, bypassing the public markets. Public markets serve the role of assembling small lots of non-uniform livestock. Once an operation has a truckload of uniform livestock to sell at one time, direct selling is often more efficient (Farris, 1983).

#### Other developed countries

Other developed countries are following the same general trends as the U.S.A. using about the same technology; however, the scale is not as great and there is not the same degree of specialization. In Scandinavian countries, producer cooperatives play a leading role in livestock and meat marketing. In Eastern Europe, the State is directly involved in physical handling as well as pricing. The livestock-meat subsector appears to be one of the most difficult enterprises for socialist states to operate efficiently because of its complexity and difficulty in being standardized.

In recent years, Japan's affluence, import and price policies have sharply increased the price for beef. These high prices have been an incentive to grain feed steers in confinement (partly with imported grain and

hay) to slaughter weights of 1300-1500 pounds! The economic signals are so strong that once a calf is born, every improved practice is used to get the maximum total beef from it. The Japanese have developed the most intensive cattle production and beef marketing system in the world as a direct result of their high price policy for beef since the 1970's.

The EC, likewise, has subsidized their dairy and beef industries. Once the largest beef deficit area of the world (Figures 2 and 3), they became the largest beef exporter in 1986, as a direct result of high internal prices for beef that reduced consumption and stimulated production. Heavy subsidies are being used to "dump" the surplus beef into the international market. This has "spoiled" the 1986 international market for beef, depressing it to \$650 per metric ton for frozen boneless beef. This is the lowest since the international depression in beef in 1975-77, and has been devastating to beef producers in the exporting countries of South America. The EC experience is another classic example of how the livestock-meat subsector responds to effective demand. In this case it was artificially high prices, whereas, the Australian case in 1975-77 (and that of all other exporting countries) was artificially low prices due to import barriers in alternative markets when the U.S. market collapsed.

The lesson here is that the EC policy makers apparently were not able to see the rapid rate and extent of development in the livestock-meat subsector as a result of their high price policies. The higher prices for cattle encouraged more fertilization of pastures, more stored feed and production of the existing inventory to heavier weights.

#### Developing Countries

The striking documentation of lack of development in the livestock-meat subsector is the low productivity of livestock production enterprises.

Developed countries with only 35 percent of the cattle in 1979, produced 67 percent of the beef (Simpson and Farris, p. 6). Behind these simple data are many complex factors contributing to low productivity such as low calving rates, high calf mortality and a much longer time required to reach slaughter weight than typical in developed countries. In the tropics where there are wet and dry seasons it is not uncommon for cattle to lose almost as much weight during the dry season as was gained in the wet season. It may take a steer 5 years to reach 800-900 pounds. Failure to use stored feed in stress periods is a source of substantial waste of food resources and a major barrier to subsector development in much of the developing world. This problem involves economics, marketing, production, management and government policy. It results in a great deal of waste of animal and grazing resources. Its relationship to marketing is the interdependence. In some cases a low price or trade policy that keeps the domestic price lower than the international market discourages stress period feeding.

The policy of free communal grazing in many parts of Africa makes the herdsman's perceived cost of gain per animal essentially zero, whereas, all other alternatives such as the use of stored feeds have a cost. In high risk survival of livestock areas, there is a tendency to focus on cost minimization. In many African countries there is no safe place to store money. Banks typically are not used and alternative investments are scarce. A herd of livestock may be about the only way for a people in rural areas to store and accumulate wealth. Livestock-crop operations are complimentary, especially in terms of handling cash flows without using a bank.

#### Marketing

In marketing it is difficult to find development problems that appear as severe as the obvious low productivity of livestock. It is not nearly as easy

to measure the waste involved in trekking cattle long distances to market, because the waste is born by society rather than the individual operators. Cattle must be grazed enroute and if they are trekked for a week or a month they have cost society that time of grazing without any gain plus some shrink and death losses. Likely a larger cost is the disease and ticks that are spread through the route to market.

In Tanzania cattle were shipped in open top rail cars designed for hauling materials like sand or gravel. There were no provisions for feed, water, or shade on trips from the interior to the coast that ranged from two to four days. Shrink and death loss was often excessive, most of it avoidable with a little extra expense and management (Farris, et al., 1976). Constructing low cost slaughter plants in the surplus production area so that long treks are not necessary is an alternative, but the infrastructure sometimes is not adequate to support it. The large number of cattle that die of starvation from severe drought also is a major waste. Adequate meat canning capacity and marketing programs to facilitate moving cattle to other areas could reduce this waste.

#### Consumption

Developing countries consumed 25 percent of the world beef supply in 1977, only 6.7 percent of the pork, 19 percent of the poultry and 46 percent of the sheep and goat meat. On a daily per capita basis, in 1977 meat consumption in the developed group of countries (including poultry) averaged 207.7 grams; in the centrally planned Communist countries of Eastern Europe, Russia and China it was 80.1 grams and in developing countries it was 30.6 grams. "The developing group's average daily meat consumption barely exceeded one ounce, a meat intake equivalent to two small hamburger patties per week -- but that was a 40 percent improvement over their 1967 meat diets." (Wheeler,

et al.).

Considering this low level of meat consumption and the fact that the developing countries have the fastest growth in population rates, there is little likelihood that Third World meat supply will be adequate in the foreseeable future. This is an overriding problem that requires attention at the highest levels of governments and international organizations.

#### Examples of Marketing Development

Available published information on successful marketing development in the livestock-meat subsector is scarce. Most of the available literature relates to problems. Many of the obvious successes are in the developed countries.

1. A Japanese example has application to the marketing of small lots of livestock in many areas of Asia. Coming out of World War II Japan had a major land tenure reform that limited the amount of land any farmer could own. Livestock production involved many small operators with only one or a few head per year to market.

Being members of a federated cooperative organization mainly oriented to crops, the cooperative, however, established livestock auction markets for feeder cattle, custom abattoirs and carcass auction markets for slaughter cattle and hogs. The principal objective was to provide effective market access to small livestock producers. They have clearly accomplished that in a period of about 30 years. This is a pattern that could be useful in other Asian countries.

2. In colonial Africa following World War II there was an active commercial beef marketing and processing industry in East and Southern Africa. The primary product was canned corned beef exported mainly to Europe. These operations were given privileged entry into the European community. Kenya and

Botswana have continued to export canned beef at a premium over the international market. Tanzania, despite donor loans and assistance to a parastatal organization, lost their sanitation and health certificate about 1975 and have had to sell at a substantial discount to other markets since. The point of this example is that it shows what can be done in tropical Africa and it shows that improved methods must be continued to maintain development.

3. During the 1970's both Tanzania and the Philippines had projects to establish public livestock markets. It was easier to provide facilities than to achieve an efficient low cost market operation. However, these appear to be successful projects although the original pricing policy in Tanzania related to the markets was not a success (Farris, 1983).

4. According to Jahnke (p. 165), the Kenya Dairy Cooperative established in 1954 was successful in that it provided effective marketing services for a large number of small dairymen in Kenya following independence. This project established a package of production and marketing services including a credit program and included construction of feeder roads.

5. In the 1970's, Syria, in response to the strong demand for live lamb and mutton in the Persian Gulf states, developed a specialized fattening industry. Lambs were imported from Turkey, grazed on small grain in Northern Syria (some were grain-fed in confinement) and trucked to the Persian Gulf for sale at a premium price. At the same time Damascus, Syria was importing lower cost lamb carcasses from Bulgaria. This overcame one of the problems often encountered in the Third World where operators are inclined to try to own livestock the entire production cycle rather than specialize and make use of the competitive advantage of other operators who have higher quality or more abundant forage.

One negative aspect of this program was the livestock market in the City

of Aleppo. The largest market in the country had no improvements except a seldom used scale and a few buyer pens. It was mainly a meeting place with no organization, no seller pens, no loading docks and no market news except by word of mouth. Sales were by private treaty. There were many buyers and sellers when I visited the market in 1979, and one might say the marketing system was performing well. The progressive aspect of market performance was lacking because they had not made use of the widely adopted improved methods of operating a livestock market. The problem is that it takes organized action on the part of an industry group or the local or national government, and apparently some interests (probably the buyers) liked it just the way it had been for many years.

#### Examples of Marketing Development Problems

1. In Damascus, Syria the parastatal meat company operated a modern plant for lamb and mutton slaughter with an overhead rail system. It had a separate section for custom or do-it-yourself cattle slaughter. This was a bed system instead of a rail system as the volume was low.

The plant appeared to be efficiently operated in 1979 and had good sanitation and veterinarianian inspection. Sheep carcasses were held overnight under refrigeration. The next morning carcasses were railed out of the cooler and transferred to the distribution company - also a parastatal. Carcasses were weighed on a modern on-the-rail scale. From this point forward sanitation management and marketing deteriorated. Carcasses were lifted off the rail for tagging. They usually were rested on the floor of the loading platform while being tagged with the weight, total price and buyer's name. Carcasses were then loaded on the floor of an insulated truck that had the rear doors removed for convenience of unloading at the many stops. The trucks went down dusty unpaved streets where carcasses were delivered to the small

privately owned shops. Orders were filled along the route exactly in the order that carcasses came out of the cooler. If a butcher ordered two carcasses they could both be top quality lambs or one might be an old ewe. There was no grading and all the carcasses were the same price, so that every time an old ewe was unloaded there was a great deal of yelling and arm waving. The buyer had no recourse and usually had to make an emergency purchase from a small (uninspected) slaughterer to service his customers with the quality they preferred. This is an example of a problem that could be rather easily and inexpensively solved, but the person who had the authority apparently did not want to be bothered, or did not know there was a problem (Sullivan and Farris, 1980).

2. In South America most agricultural exports are taxed - sometimes at the same percentage rate, sometimes at a differentiated rate. Five of the beef exporting countries in South America were studied in 1973 and it was shown that the export tax system was a disincentive to export the higher value added beef products. In all of the countries there was chronic unemployment and a critical need for foreign exchange. The GNP multiplier was estimated at 3.3 for exporting live cattle, whereas bone-in carcass sections or frozen boneless beef had a multiplier of 4.0, canned beef was 4.4 and cooked-frozen was 4.9. We found no case where the higher valued product had a lower percentage export tax to provide an incentive to generate more employment and economic activity (Simpson and Farris, 1974).

This is one of several policies that discourage development in an industry where several South American countries have an absolute, as well as a competitive advantage in trade.

3. Many countries in the Third World use food price control to indirectly augment consumer income and/or minimum prices to augment producer

income. A typical problem with meat and livestock is that quality differentials are either very simple or absent. This discourages practices that would improve quality.

In Tanzania, the parastatal livestock marketing company was the dominant buyer of cattle, supplying all of the cattle to the only commercial slaughter plant in the country and also buying immature cattle for the state owned ranches.

The price policy was a flat price regardless of location and a small premium as weight increased. This automatically made young cattle the lowest price. Since small herdsmen, traders, and butchers could react to the fixed price of the parastatal buyer, the result was that most of the cattle offered to the livestock marketing company were lowest quality, mostly cull cows, at a long distance from the capital city on the coast. Advice from expatriot advisors had no impact. It was only after several years when the international market improved and very few cattle were being offered to the parastatal company that the policy of fixing cattle prices was dropped. The way for government to best help small farmers and herdsmen is to provide public markets, try to control fraud and supply credible market information. Other examples are listed later, but a set of related problems in developing the livestock-meat subsector are summarized below.

#### Problems in the Third World

1. Progress in livestock-meat partially is tied to the economy.

Lack of progress in livestock-meat subsector is partially related to the lack of development of the economy: (a) The lack of legal and economic environment to foster efficient markets and business practices. (b) Lack of development of infrastructure such as roads, transportation and utilities hinder use of modern marketing, processing and refrigeration.

2. Low effective demand due to low incomes.

Low effective demand is such that most consumers cannot pay for convenience, and services that enhance and maintain quality of meat. As a result there are fluctuations in supplies and meat often must be consumed the same day it is slaughtered.

3. Marketing livestock is expensive.

Livestock marketing systems in the Third World are relatively expensive compared to those in developed countries, partially because transportation and exchange is expensive. For this and other reasons, they often do not properly facilitate exchange of livestock in moving them to slaughter or to better pasture in other areas for those animals not ready for slaughter. Government regulation of marketing and marketing agents often interferes rather than facilitates efficient movement.

4. Slaughter facilities are inadequate.

Livestock slaughter facilities are generally very simple. Some slaughter is primitive, especially in Africa, often employing no facilities at all. Poor sanitation and no health inspection is often a problem. Sanitary and efficient slaughter facilities with proper inspection and waste disposal can be provided in sizes suitable (from the small village to the large metropolitan area) at low cost per head of livestock. This would appear to be a good investment for any society. For long-run efficiency in the livestock-meat subsector there must be seasonal and cyclical excess capacity in slaughter plants to handle emergency conditions during drought, otherwise many animals die of starvation. This excess slaughter capacity is a common condition in the U.S. - where stored feed is commonly available. Where the entire livestock population depends on the standing forage the excess capacity is even more important. Careful planning of

slaughter plant location, size and design is necessary for economical operation, however. Vacant and abandoned plants do not contribute to development.

5. Meat processing is mostly for export.

Meat processing, if done, is mostly for export and does not provide the Variety, convenience and storability available in most developed countries. For some countries, permitting a low import restriction for imported meat processed products may be the most economical way of providing consumers with these product alternatives.

6. Government services inadequate.

Government services required for inspection, market news and other market intelligence such as available supplies, and grades and standards are often inadequate. The cost for these services is mainly the cost for personal salaries. In most cases these economies have high unemployment rates and the indirect cost to the economy would be relatively small.

7. Price control often distorts incentives and discourages technology.

Market, custom, or government regulations may not provide producers with the proper incentives for improving quality and timing of marketing livestock. Price fixing is not uncommon and this distorts the signals between consumers and producers. Government price setting generally is unable to provide the refined incentives to obtain the quality and/or service on which consumers and suppliers would agree in its absence. Often this discourages the use of more technology or services.

8. Lack of off-season feed supplies.

The practice of permitting cattle to lose substantial weight during the dry season (or winter) delays slaughter 1-3 years. This compounds overstocking problems and results in a waste of both cattle and range

resources. It does not provide consumers with a continuous supply of uniform quality.

9. Shortage of trained management and marketing. There is typically a shortage of trained management and marketing professionals in the Third World. The problem is most acute in the countries that recently gained independence. Mainly because the subsector has so much variability, there is perhaps no other enterprise where there is a greater need for decentralized management and marketing; and this depends on a relatively large number of skilled operators.

#### AFRICA - Nature of Subsector

##### Low Productivity

Tropical Africa is one of the least developed world regions with most of the world's poorest countries. The economies of these countries are varied but most of them depend heavily on agriculture. Foreign exchange often depends on a few export agricultural commodities. "The performance of livestock as a part of agriculture is particularly disturbing. While some modest productivity improvements have taken place in cropping, livestock production increases in the past have been largely due to numeric expansion of herds and flocks rather than to improvement of the productivity. Overgrazing and resource degradation characterize livestock production over much of the region while the apparent potential in other regions is not used at all," observes Jahnke (p.1.).

Major livestock areas like the Sahel and parts of Eastern Africa are high risk drought areas where there is a constant threat affecting the survival of livestock and people. Livestock systems are typically subsistence, but a few improved operations exist on large ranches from the Colonial period and in the highlands, but dairy operations have a competitive advantage in the highlands.

Most of the cattle in tropical Africa are herded by subsistence farmers or semi-nomads or nomads and are basically kept for milk. Sheep and goats are kept for a more regular family meat supply. The herds are mixed species and multipurpose, used for milk, meat, fertilizer, hides, and a store of wealth.

Wild animals are a constant predator threat in many areas and livestock are typically brought back to the boma at night for protection from animals and from theft. Tsetse flies and the diseases they carry prevent the use of some of the more productive grazing areas. Jahnke says that tsetse flies cover about 40 percent of tropical Africa.

Southern Africa has achieved a higher level of development in livestock production and marketing. In South Africa the livestock industry is modern with methods similar in many respects to Europe and North America despite the coexistence with wild animals in some areas. Commercial feedlots are used in South Africa and the marketing system is a mixture of private enterprise and government regulation. Livestock products account for 37 percent of the total value of agriculture (South African Dept. of Agriculture).

Livestock marketing in Subsaharan Africa consists mostly of trekking cattle to market or to the railroad for the trip to the abattoirs or packing plants. In villages, local butchers often slaughter with little or no facilities. Livestock markets are primitive and generally with poor facilities. At auction markets operated by the government-owned parastatal marketing company in Tanzania, there was substantial private treaty trading outside the auction, partly because it was too slow. A simple change in facilities and management could have changed that. Many of the cattle are purchased in the villages and then sold to other herdsmen at public markets, local butchers or a slaughter plant in the city. In several countries the government, in the form of a parastatal corporation, operates the export

oriented plants and the slaughter plants in the cities where the meat is consumed.

Although there are cases of unused poorly located and poorly operated plants, there is a shortage of plant capacity and a shortage of small plants to serve small villages. A village facility consisting of a concrete pad with drainage, running water and equipment to hoist and move carcasses for skinning and cleaning is an improvement over no facilities.

#### Small Stock to Increase

Subsaharan Africa has more than one-third of the goats in the world and almost one-fifth of the sheep. Ownership of small stock is extremely variable among Africans. Herd sizes are greatest in the drier areas. In the humid coastal zone of West Africa there may be only one or two small stock per family. In many cases, the small stock provide most of the family meat supply as cattle and camels are generally regarded as dairy animals. Meat, milk and skin production from African small ruminants is, respectively, 16, 14 and 15 percent of the world output from goats and sheep. Goats produce altogether about three times as much milk as sheep (Wilson).

Wilson explains, "Goats assume more importance than sheep as the management system moves from nomadic to sedentary and from purely pastoral systems to mixed crop-livestock systems...."

"With increasing pressure on land due to higher human population levels, it is probable that numbers of small ruminants, in part because of their wider dietary range, are increasing relative to cattle. An additional advantage accruing to small ruminants is their early physiological maturity and rapid reproductive rate. Because of their ability to produce a greater number of twin births, goats are undoubtedly also increasing faster than sheep."

Small stock can provide food for the family after severe droughts much

quicker than cattle and camels. They have a longer term ability to withstand difficult conditions, according to Wilson.

With small stock combined with the cattle herd, herdsmen are able to reduce the seasonal variability in the family food supply as illustrated by Figures 4 and 5. In addition, their production recovery from long-term drought is faster. Wilson provides data which shows small stock slaughter in four countries at 35 percent of the herd in 1970 prior to drought, then slaughtering at 45 percent in 1976 after the drought.

A number of authors predict that small stock will be a more important source of meat and milk in Africa in the future (both absolutely and relative to cattle), especially for the smaller operator's family food supply, but also for commercial markets. Some of these same authors also note that the marketing system is generally not as well organized to service the small stock industry as it is for cattle. This means that in some areas, special attention must be given to small stock marketing.

#### Small Stock Marketing

Little detailed published information on marketing small stock in the Third World appears to be available. An unpublished report prepared by Bassett and Harston for USAID in Botswana provides information that applies to several areas of Africa.

At the outset they point out that effective demand is a key factor in determining the role of an agricultural enterprise when there are close substitutes in a market economy. They observe that sheep and goats often appear to be only supplementary, as the market does not appear to have much direct bearing on the ratio of cattle to small stock in the production systems of Botswana.

Local sales of small stock to neighbors and to local abattoirs accounted

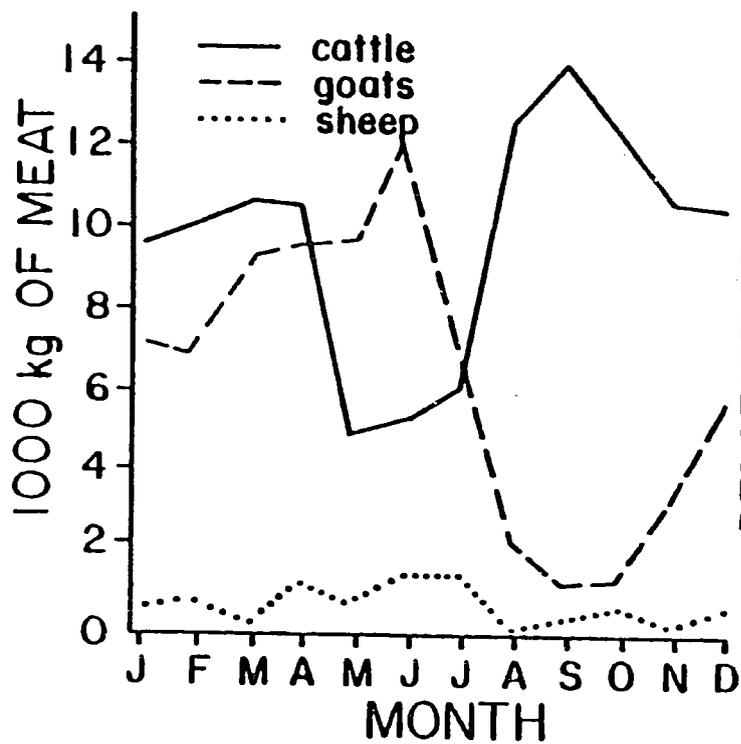


Figure 4 Contribution of goats and sheep to the meat supply of a Sahelian town in Mali

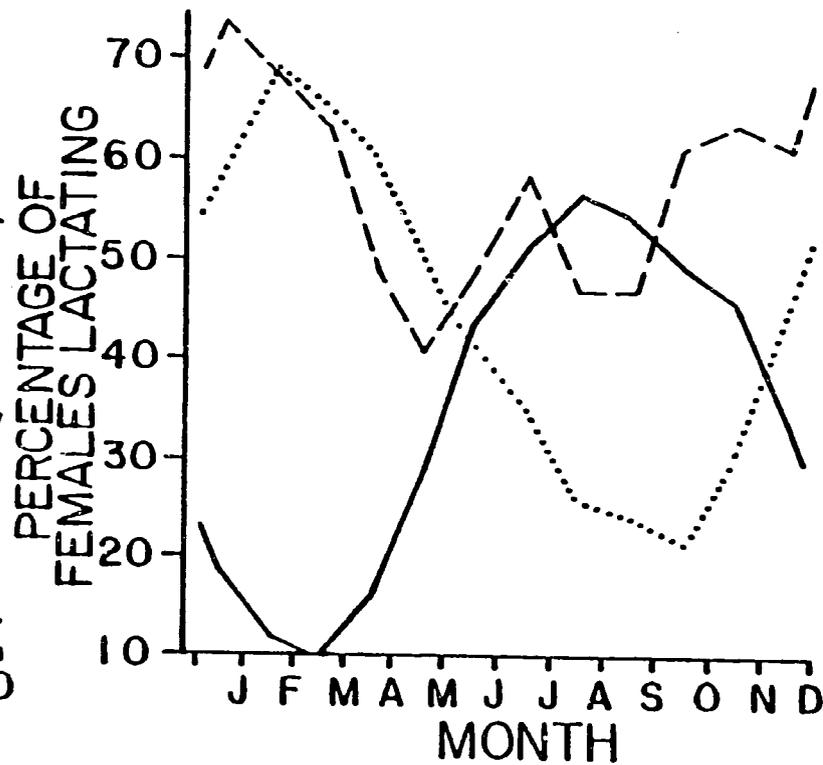


Figure 5 Seasonal variations in females lactating in Sudan

Source: Wilson, Trevor R., *Livestock Development in Subsaharan Africa*, J.R. Simpson and Phyllo Evangelou, Eds. Westview, 1984.

for more market transactions (41%) than any other type of buyer, according to a market survey. Traders were second with 36%. Cooperatives made 17% and direct sales to Botswana Meat Commission (B.M.C.) were 6% of the transactions. Apparently the number of head per transaction was the inverse of transactions by type of buyer, according to Bassett and Harston.

They observed that marketing of sheep and goat meat was irregular and neither the butcher or consumer can be assured of a dependable supply because of the absence of a marketing system that slaughters and distributes the product in a regular and predictable manner. B.M.C. is geared to large volume handling for export and not oriented to local distribution.

"The prices for sheep and goat in the local butcher shops is surprisingly high, even higher than beef in some cases. The butchers and others in the marketing process could possibly handle the meat at smaller margins if the volume were greater and supply more constant," Bassett and Harston speculated. Clearly, improved marketing systems emphasize higher volume and lower margins. However, higher marketing margins on sheep and goat meat are typical even in developed economies due to a variety of factors, a primary one being a lower yield of retail meat from live sheep and goats compared to cattle. For example, a lamb or goat produces about a 50 percent or less carcass yield, whereas, a steer will produce about a 55 percent carcass yield.

Bassett and Harston observe that the country has only one commercial slaughter plant and suggest that the feasibility of one or more small slaughter plants located in the rural areas near the source of goat and sheep production should be studied. The feasibility of this type of operation depends on the reliability of quick delivery to the consumers. Generally where the "hot meat trade" is common, slaughter plants need to be close to the population they are expected to serve.

### Recommendations

The report notes that the most frustrating problem that producers of small stock face is the inadequate market for small stock compared to a ready export market for beef. Suggestions for improvement in small stock marketing made by Bassett and Harston are recommendations that would apply to many of the countries in Africa. These were:

- (1) Establish a timely market news service along with reports of available supplies
- (2) A grading system that facilitates communicating prices classified by different qualities or livestock characteristics
- (3) Strengthen cooperative marketing to provide an alternative to traders
- (4) More specialization in production and marketing
- (5) Improve government services, including regulation of country livestock market practices
- (6) Allow B.M.C. prices to be more flexible, reflecting seasonal factors as well as the differences in export and domestic demand
- (7) Additional slaughter facilities to serve the domestic market
- (8) Establish a land tenure reform that would facilitate controlling stocking rates consistent with available resources.

### Marketing Policies

Sullivan states that livestock-meat subsectors in many subsaharan countries are operating at low levels of technology and commercialization. He argues there are a variety of reasons, but a central impediment is price policy.

Frequently, price policies have the effect of providing the urban areas with lower priced meat than an open market system. The result is distortion of trade patterns with more live cattle exports to neighboring countries and

more of the better quality livestock being slaughtered by the "black market" and/or local butchers rather than the commercial slaughter facilities. Meanwhile, producers have less incentive to market livestock in a timely manner and engage in improved production and marketing practices.

Sullivan cites two examples to illustrate the market performance problems when government attempts to control prices of such a decentralized industry with highly variable quantities and supplies. He compared market performance of Ghana and Tanzania's livestock-meat subsectors in 1979 when both countries were controlling their respective red meat markets. Market performance for each is compared with the 1969-71 period when there was less control. Ghana, on the West Coast of Africa, is a net importer of meat and livestock, whereas Tanzania, on the East Coast, has been an exporter of livestock and meat.

"Government's role in the livestock meat subsector of each country varied in degree. Each country undervalued its domestic production to supply inexpensive animal protein to urban consumers by instituting price ceilings on meat. .... Retail meat prices were controlled and based on a formula pricing mechanism," according to Sullivan. These prices are shown in Table 1.

"An overvalued exchange rate in Ghana distorted the market price for imported beef. .... Beef was undervalued compared to other scarce goods available. The shortage of red meat in the government shops was evidence of the distortion of price as a rationing mechanism," Sullivan reports.

"In Tanzania the live animal price for cattle paid by the government marketing board was a flat price based on a weight range with no differential for quality, season or location of purchase. Government also fixed the price at retail for beef. The government retail prices were not competitive, being about 65 percent of the actual retail market price" (Table 1), Sullivan explains. In addition to shortages of meat in the capital city of Dar es

Table 1. Meat Price Statistics for Ghana and Tanzania, 1979

Country	Meat Product	Border Price at Govt. Exchange Rate	Border Price at Shadow Exchange Rate	Govt. Retail Price	Market Retail Price
-----Currency/KG-----					
Ghana	Beef	Nc1.26	Nc5.49	Nc3.35	Nc7.00
	Lamb and Mutton	--	--	Nc4.32	Nc20.00
	Goat	--	--	Nc4.32	Nc20.00
Tanzania	Beef	--	--	Tsh 5.90	Tsh 9.32
	Lamb and Mutton	--	--	--	Tsh 9.00
	Goat	--	--	--	Tsh 9.00
	Canned Beef	Tsh 10.10	--	--	--

Source: G.M. Sullivan

Salaam there was a shortage of supplies for the beef canning plant producing corned beef for export.

Sullivan states, "The potential for administered prices to improve the orderly development of the livestock industry in Sub-Saharan Africa is perceived as low, administered prices are usually based on political and social concerns rather than on efficiency principles."

Most governments are not willing to let the free market be the sole allocator of agricultural products. When deviating from this approach, policy makers and citizens need to be aware of the likely impacts of the specific policy, and in the Third World the question should be asked, "What would this do to development?" In the last two cases, they clearly would have a negative impact on livestock development. Tanzania has since moved back toward open market pricing. I am not aware of any changes in Ghana.

In all areas, governments and government agencies apparently prefer to foster development; however, there are always conflicting political and social objectives. To make effective and timely policy, policy makers and agency heads need a flow of accurate information concerning developments in all aspects of the subsector. My impression is that this is one of the critical problems in most African countries. Under these circumstances, a decentralized open market system is likely to be more effective in fostering development. An example of this problem was experienced by a State owned dairy farm in Tanzania in 1975. Despite a shortage of pasture, the manager had the entire crop of bull calves on hand. Some were nine months old. He explained that he had been unable to get permission from the Central Government official to sell them.

#### Marketing Efficiency

One can find a wide range of differences in livestock and meat marketing

methods even in the same city in Africa. Meat sold to the very poor may not use any marketing methods or tools that were not in use a century ago. Quality, sanitation and service would be about as low as a century ago. For the higher income and the tourist trade, the level of use of technology is higher and so is product quality, sanitation and service. This improved system, however, accounts for a very small part of the total volume.

In marketing livestock, improved practices depend a great deal on development of transportation, communication, and commerce. Despite the lack of development in these areas there are some studies that report "efficient" and "satisfactory" marketing systems.

Janke (p.90), reviewing the Michigan State University livestock marketing studies by Herman (1979) and by Staatz (1979) noted findings of generally good performance in the functions of distributing livestock and meat products at reasonably low costs. Herman's study in Upper Volta specifies evidence of a high degree of competition, low concentration ratios (among buyers and sellers) and the absence of overt collusion. Other measures show traders' margins to be consistent with transportation and transaction costs. Even the traditional trekking has its cost advantage over rail or truck, because "... in rail or truck transport -- shrinkage losses become a major cost item." Transportation is often expensive and lacks dependability; however, the problem of shrinkage can be controlled. On long distance hauling one simply must off-load livestock for rest, feed and water. In the United States there is a law that requires it. If shrinkage is a major problem, then the system is not "efficient." Traders may cope with this problem by managing to trek livestock using free or low cost grazing and water enroute to avoid shrink.

In countries where open markets exist and traders are allowed to enter without any effective barriers, good market performance might be expected

(considering the lack of infrastructure) if government is also providing minimum marketing services. Where inefficiencies are much more likely to exist is when government sets prices and parastatals are involved - in some cases with the charge to replace "private middlemen." Under these circumstances, signals from consumers to producers are distorted and inefficiencies usually follow. In Evangelou's study of cattle marketing efficiency in Kenya's Maasailand, he concludes that, "In terms of the market structure-market conduct-market performance model a generally efficient level of performance is inferred from the market's structure and traders' conduct. Though mean returns per sale for traders, (especially those operating in the Kajeado sample area) appear excessive, trading risks and past non-sale options help to explain the trading margins."

He reports that although truck transportation is being used for both feeder and slaughter cattle, the economics over the long run was still not clear. Before it becomes a widespread marketing alternative more market oriented production conditions must prevail and meat price controls must be changed to permit prices to cover transport costs. Evangelou raises as many questions as he answers about marketing efficiency because the gross marketing margin just for buying live cattle and trekking to the Nairobi area for slaughter was 90 percent. Ownership changed hands enroute and the total trekking costs were 20 percent. Evangelou was unable to explain the high profit margin. Other estimates were 18, 21, and 13 percent that involved ownership of just one week. He summarizes that, "Local-level trading mechanisms in Maasailand are not an overriding constraint to the region's livestock development. Apparent sources of inefficiency, from nonpublic price negotiations at poorly equipped markets to the long-distance trekking of stock, do not create undue costs or constrict product flow, under present

production conditions." It appears that these margins are higher than would be encountered in most developed countries for moving livestock comparable distances. The 90 percent gross margin is extreme. Evangelou feels the others are representative.

Kenya's livestock-meat subsector appears to be more developed than some other African countries. In production there are several alternative systems such as group ranches, cooperative ranches and private ranches where some degree of control over stocking rates and grazing patterns is exercised. The fact remains, however, that livestock and meat production and marketing in East Africa apparently had a higher level of development of the livestock-meat subsector three decades ago than at present. There were more specialized operations using improved production and marketing practices. This should provide some assurance that the traditional system can be improved if basic policies are established and proven management and marketing practices being used in Southern Africa and on other continents are ~~adapted~~ (not directly adopted) to the Subsaharan livestock-meat subsector.

Jahnke's discussion of crop-livestock production systems in the highlands of tropical Africa relates improved production and marketing systems where intensive production methods introduced in the colonial period are being continued to produce higher quality beef from fodder and/or grain feeding. He suggests that beef will continue to lose competitive position to dairy in the highlands as population pressure increases, accompanied by decreasing average farm size. He reports that economics does not justify growing out and feeding male dairy calves on many of the intensive dairy systems as these are killed as small calves. He suggests that use of small stock for meat in these areas will gain in importance.

Although there has been grain feeding of cattle in Kenya, Jahnke (p.

213) holds that although there are special circumstances that favor it as prices fluctuate, that there is a tendency to swing back to the grain price/live cattle price ratios which shows the USA and Canada with the most favorable ratio at 1:10-12 and some countries in Africa with the least favorable price ratio of 1:2-3, where the EC countries are 1:7-8 and Australia and Argentina are 1:4-5.

Jahnke, in his publication entitled "Livestock Production Systems and Livestock Development in Tropical Africa," says "There are not many striking examples of successful livestock development in Tropical Africa. Dairy development in Kenya is one and it therefore appears justified to focus on this example when discussing dairying as a livestock development possibility.

"Large scale dairy production, mainly aimed at the urban market and at exports, reached its peak shortly before independence, when about 600,000 grade dairy cattle were kept on large farms, practically all owned by Europeans." A small holder dairy project that had its beginnings in 1954 is playing a vital role in Kenya continuing to be the only net dairy exporter in Africa. These dairies are part of a cooperative program that assembles, processes and markets the milk (Jahnke, p. 169).

#### Marketing Pastoral Livestock

Under communal grazing conditions pastoralists are being given free grazing privileges with rights to deteriorate the pastoral areas. Under these circumstances the cost of keeping a steer from four years old to six years old is essentially zero, but the gain in value must be examined against the value to the society of the use of that grazing for other livestock, especially lactating females. When pastoral livestock is viewed from the macro system, its inefficiency becomes more apparent because of the conflict of individual actions with that of the group of pastoralists. Grazing fees

that would be put back into range improvement would place an incentive not to waste range resources just because they appear to the individual to be free and have no alternative use.

There will be little if any long-run improvement in pastoral livestock production and marketing unless the pastoral area is either converted to individual parcels or is managed by a group or by the State where range and marketing improvement is central, viewing the entire area as one production unit. The managing group must recognize that as long as individual herdsmen or extended families maximize their own self-interest by maintaining the largest possible herd, the herds and the range will have low productivity.

Sullivan, Farris and Simpson studied a village controlled grazing area and evaluated by a range-herd simulation model several alternative production and marketing practices. A simple village marketing policy requiring unproductive cattle to be sold at the beginning of the dry season increased the ten year average annual value of a village herd output by 18 percent for one village with moderate rainfall (818 mm.) and 31 percent in a village with lower rainfall (537 mm.).

#### Summary

Production and marketing efficiency is very low in Subsaharan Africa. Some areas use essentially no improved technology or methods. The result is no increase in per capita meat supply or quality improvement in the last 20 years. The primitive system is extremely wasteful of animal agricultural resources. Marketing and price policy problems often discourage development.

Governments must make some fundamental changes in price, marketing and land tenure policies if they wish to encourage improved practices. Progress in increased small stock production and marketing should be given special attention as many professionals believe this has the greatest potential.

development payoff.

Improvement in market structure, market policy and market services could be a great stimulus to development; however, this requires commitment from top level administration.

There are some African examples of improved production and marketing systems; however, there are still professionals that are skeptical as to whether practices widely used elsewhere in the world can be adapted to their country. This suggests that regional conferences, training programs and research would be productive in increasing awareness, knowledge and potential of livestock-meat subsector improvement.

#### LATIN AMERICA - Nature of Subsector

The level of development in the livestock-meat subsectors is generally higher in Latin America than is the case for Africa (except for South Africa). Land tenure in Latin America established private property early in its development and large cattle operations became rather common. Some of these were oriented to meat exports to Europe. Development has been more on the order of that in the United States rather than Western Europe mainly because of the large specialized cattle and sheep operations. European influence can be seen in the operation of markets, packing and retailing, however. The main role of refrigeration in development is for export, although refrigerated service meat cases are common in cities, but the "hot meat trade" is still common, especially in the lower income areas. Use of self-service refrigerated retail meat cases is not widespread. Trekking cattle to market is not uncommon, but modern truck transportation is used in most areas to move livestock. Some of the older highways in Argentina were designed with wide

spaces on both sides for driving cattle to market.

#### Low Costs - Low Prices

Like all large areas, there is great diversity in Latin America. In the beef exporting countries of Central and South America the large scale specialized commercial operations are low cost-low return per unit businesses. In most cases returns not only are insufficient to cover regular confinement feeding of grain, they are not adequate to pay for the use of stored feed during stress periods. There have been times, places and conditions where confinement feeding of livestock for slaughter has been done. During the growing prosperity of Mexico in the late 1970's, grain finishing of cattle became an important industry in Northern Mexico. It was tried in Brazil in 1973, but government changes in maximum prices for beef made it unprofitable to continue.

Export taxes are in many cases levied on meat directly and sometimes indirectly by a differentiated rate of exchange on exports. This causes the domestic price of livestock to be below the international price and discourages the use of some improved production and marketing practices.

In different areas (but sometimes alongside the large scale) are smaller operations directed mostly to local markets or to producing feeder animals for the fattening areas with higher quality forage. Marketing problems are more acute for smaller producers for all the same reasons as elsewhere. They have less market information, and often do not have transportation for hauling livestock and therefore have to depend on traders for their market. This can be an efficient outlet if there is easy access to market information and other traders.

In many areas the tropical climate and poor quality forage result in low productivity. Production costs are low because forage is available the

year-round. In the lowlands of Bolivia and Columbia, for example, most steers are at least four years old before slaughter. Practically all the heifers are kept for replacements because of low calving rates.

#### Marketing

Some of these cattle in Bolivia are slaughtered in the lowlands and the meat shipped by plane to La Paz. With this system, refrigeration is not required.

#### Consumption

Per capita consumption of meat in South America was projected to exceed the world average of 32.5 kg. in 1985. Argentina was by far the highest at 119.5 kg. (just below the U.S.A. at 120), Venezuela was second at 47 and Brazil third at 44.4. Other South America averaged 34. Middle America averaged 30.9 (Table 2).

Beef accounted for most of the Argentine meat consumption, whereas, for the rest of Latin America it accounted for about one-half. Pork and poultry shared most of the rest about equally, except for Venezuela where poultry at 14.8 kg., accounted for about 3 times the consumption of pork.

In most areas pork is more expensive than beef because pork requires grain feeding. Two decades ago poultry was also more expensive than beef in most places, but poultry prices are currently lower than beef in most of the region. The difference, however is usually much more narrow than in North America and Europe. This is indicated in Table 3 which shows pork cuts as high or higher than chuck roast, and chicken 63 percent of the chuck roast price in Buenos Aires and 59 percent in Mexico City in March, 1981. Chicken in Washington, D.C. was only 17 percent of the chuck roast price and in Paris and Madrid, only one-third the chuck roast price. This extremely low retail price for poultry meat coupled with a wide variety of product forms and

Table 2. Per Capita Meat and Egg Consumption Projections for 1985, by Region

Regions	All	Beef	Pork	Sheep &	Poultry	Eggs	Milk <sup>a/</sup>
	Meat			Goat			
----- Kq./Capita -----							
United States	120.19	62.93	27.34	0.99	28.93	15.99	240.17
Canada	114.69	62.25	25.40	1.24	25.80	12.57	272.73
EC-6	86.92	30.64	37.94	1.83	16.51	14.31	362.79
EC-3	77.94	27.36	28.28	7.90	14.40	13.72	365.09
Other W. Europe	74.38	22.85	29.62	4.54	17.37	14.18	265.77
Japan	37.35	6.71	16.99	3.17	10.48	19.62	88.69
Oceania	129.30	71.44	13.70	27.56	16.60	12.57	220.74
South Africa	43.95	22.85	3.23	7.56	10.31	6.30	113.19
Eastern Europe	80.00	21.76	40.65	2.65	14.94	15.10	357.84
Soviet Union	62.06	32.07	16.76	0.69	8.54	15.75	423.98
China	23.38	2.32	15.31	0.89	4.86	4.45	6.03
Middle America	30.92	15.73	6.43	1.68	7.08	7.71	130.76
Argentina	119.49	95.82	9.91	3.93	9.83	8.15	203.99
Brazil	44.39	27.47	9.11	0.58	7.23	4.12	121.03
Venezuela	47.03	25.99	5.87	0.39	14.78	8.51	99.32
Other South America	34.05	21.45	4.88	2.73	4.99	5.20	102.13
H. Inc. N. Afr. & M. East	29.92	5.16	0.34	11.40	13.02	6.90	64.43
L. Inc. N. Afr. & M. East	19.29	7.31	0.04	8.45	3.49	4.71	25.55
East Africa	15.49	10.66	0.78	1.51	2.54	1.84	35.42
Central Africa	9.58	4.87	0.79	2.52	1.40	1.60	12.67
India	1.29	0.33	0.11	0.66	0.19	0.11	14.79
Other S. Asia	4.59	2.01	0.03	1.96	0.59	0.73	12.22
Thailand	13.29	4.47	5.23	0.00	3.59	4.72	13.72
Other S.E. Asia	10.40	1.67	6.86	0.06	1.81	2.72	5.41
Indonesia	3.41	1.40	0.86	0.36	0.79	0.64	4.62
H. Income E. Asia	25.50	4.90	12.37	0.33	7.90	11.31	27.04
L. Income E. Asia	15.10	3.34	7.77	0.19	3.80	5.05	36.32
Rest of World	21.62	10.06	4.66	3.71	3.19	6.11	39.37
World	32.48	12.73	10.95	2.25	6.55	6.45	98.8

<sup>a/</sup> FAO

Source: Winrock International

TABLE 3. Average Retail Food Prices in Selected World Capitals  
March 3, 1981

	Paris	Madrid	Wash. D.C.	Buenos aires	Mexico city
	(U.S. dollars per kg.)				
Steak, sirloin, bmls.	9.72	7.44	9.46	7.12	4.78
Roast, chuck, bmls.	9.68	5.07	7.47	6.67	4.36
Pork chops	4.98	3.86	5.71	6.67	4.53
Roast pork, bmls.	5.73	5.94	3.90	9.34	6.16
Bacon, sliced pkgd.	18.84	7.91	3.13	11.57	4.42
Broilers, whole	3.45	1.65	1.30	4.18	2.57
Eggs, doz.	1.90	1.28	2.18	1.91	.90
Cheese, cheddar	7.35	7.55	3.86	12.01	11.90
Milk, whole, liter	.62	.47	.73	1.56	.47
	Index Based on Chuck Roast Price				
Steak, sirloin, bmls.	1.00	1.47	1.27	1.07	1.10
Roast, chuck, bmls.	1.00	1.00	1.00	1.00	1.00
Pork chops	.51	.76	.76	1.00	1.04
Roast Pork	.59	1.17	.52	1.40	1.41
Bacon, sliced	1.95	1.56	.42	1.73	1.01
Broilers, whole	.36	.33	.17	.63	.59
Eggs, doz.	.20	.25	.29	.29	.21
Cheese, cheddar	.76	1.49	.52	1.80	2.73
Milk, liter x 10	.64	.93	.98	2.33	1.08

Source: Compiled from USDA, FAS, Foreign Agriculture, April, 1981.

convenience are the reasons the U.S. has the highest per capita poultry consumption of any country despite the abundance of red meat. Pork and poultry prices not being lower relative to beef in Latin America is partially due to the higher relative cost of grain production versus forage production than in North America and Europe.

#### Livestock Marketing and Slaughter

Livestock marketing facilities in Latin America vary widely. Typically there are the large markets for slaughter cattle in the major cities with the slaughter plants nearby. The decentralization of slaughter plants to the production areas has not taken place in Latin America as is the case in North America (with a few exceptions such as Bolivia and Brazil). A principal reason is that marketing unrefrigerated meat is common practice. Under this system slaughter plants need to be near consumers. For plants oriented toward the export trade it would appear the economics would favor location closer to cattle finishing areas — once the outlook for growth in exports becomes clear. Exceptions are where some of the cuts from the carcass must be marketed in the "hot meat" trade of the coastal cities. Slaughter plants for export must meet international standards and this includes refrigeration unless it is strictly a canned meat plant.

Among the slaughter plants for domestic markets there is great variability. Some are not managed well in terms of maintaining acceptable sanitary standards. Improvement in facilities and health and sanitary standards is needed in many plants as pollution and sanitation become a bigger problem in most cities. New plants should consider including refrigeration.

The cost of adequate slaughter and processing facilities for meat is such a relatively small part of the total retail price of the meat that most societies should not cut corners on this aspect of the marketing system.

More general livestock markets especially for feeder cattle and cows are located in the production areas. They differ slightly from U.S. markets but appear to be reasonably efficient. No doubt one could find small producers with the usual small volume marketing problems. The main problems, however, often relate to government price and tax policies and lack of effective government market services.

#### Retail markets

Wholesale and retail prices are often controlled or influenced by government - resulting in depressed producer prices and fewer improved production and marketing practices. In addition, quality differentiation is not as clearly rewarded as in the developed countries. In some cities, inshipment from other areas is not easy, either because of city officials, labor union leaders (or both). Where prices are not controlled this results in misallocation and price inefficiency. Where prices are controlled, it may result in the level of quality being lower than in a city where there is easy entry for wholesalers and retailers.

Harrison, et al. studied retail and wholesale markets in Cali, Columbia; La Paz, Bolivia and Recife, Brazil. They observed that, "Some of the highest profit levels in the traditional urban food system are found in the institutions specializing in meat marketing.... In the case of Cali, these (high) profit margins are primarily the result of limited space availability within the public market for meat retailing and municipal restrictions on the number of meat wholesalers who can purchase through the city slaughterhouse.

"The existing meat system provides a minimum of consumer services and results in an unnecessarily low quality product. Improved services and quality could be provided at the same or lower costs. Pricing and transaction practices do not facilitate the transmission of consumer preferences through

the system. Inadequate sanitation in meat handling endangers the health of consumers and reduces the meat's eating qualities."

Harrison, et al. recommended improved sanitation and health inspection, special attention to improving the performance of wholesaling and retailing in the low income areas. Noting that most consumers have no refrigerators (56 percent in Cali and Recife) they recommended that the unrefrigerated meat marketing tradition be continued, but that more refrigeration be considered for those customers who could afford to pay for it.

Available data for analyses of marketing performance in the literature is scarce. Fenn (p. 157) reported 1972 livestock-meat marketing margins in Lima, Peru that appear on the surface to be what one would expect of competitive markets. The farmer's share of the retail price was 65.7 percent for prime grade cattle, 64.3 percent for prime grade sheep and 75.3 percent for prime grade pigs. This is generally higher than many developed countries and is certainly higher than the U.S. producer margins.

If one knew the local circumstances they might suspect that the marketing margins ranging from 25 to 35 percent paid for a minimum of consumer services and sanitation as in the Harrison, et al. study reported above. Furthermore, one could speculate that low income consumers preferred not to pay for added services and sanitation. Because consumers are not in a position to evaluate sanitation it becomes the responsibility of government in most societies to establish and enforce minimum standards.

It is also not uncommon in many Latin American countries that government has fixed maximum retail prices for meat; therefore, the marketing firms follow a strategy of minimizing costs. This often leads to reducing the quality and amount of services. Where markets are not providing alternatives in products and services, it is usually because governments have not created

the economic environment for this to be done or unknowingly enacted policies that directly discourage it.

A comprehensive set of studies of market performance in Third World countries would be very useful, especially if they were done so that comparisons among countries could be made.

#### Marketing policy

Marketing takes place within the legal and economic framework of the economy where it is located. All countries have different economic policies, but a rather common policy in much of Latin America is to tax exports and/or establish maximum prices for important food products; whereas many developed countries subsidize or protect agriculture markets and subsidize producers. In the case of an export tax (sometimes in the form of a differential exchange rate) the maximum domestic price is the international price for a specific quality of meat less the "export tax". This subsidizes consumers at the expense of producers and tends to discourage the use of improved production and marketing practices. Bale and Litz estimated the domestic price of beef in Argentina was 72 percent of the border (or international) price for 1976. In 1967, an Argentine rancher explained that a rancher typically could only afford to spend money on absolute essential practices such as minimal health care and fencing. At that time live fat cattle were U.S. \$8 per cwt., about one-third the price of U.S. fat cattle. The market situation for Argentina and other South American beef exporters has not improved since 1967 except for short periods.

In a study of Brazil's beef and dairy policy, da Silva, et al. stated that "Policy makers have used the domestic market and external trade to hold down the price of beef to consumers and to increase the supply in the off-season. They conclude that a high rate of implicit taxation was imposed

on the beef and dairy producers during 1949-1979. Farm level prices were more than 30 percent below free trade levels, reducing beef production and exports, while lowering prices to urban consumers. They concluded that when the effects of price distortions and production disincentives are combined, large economic losses are seen to be the result of government policy.

#### Summary

In many Latin American countries livestock and meat markets are held below the free market equilibrium levels either by government setting prices, or by export taxes being levied on meat exports. The result of this is that producers subsidize consumers (and in some cases the non-agricultural sectors) with the export tax. Lower levels of improved production and marketing practices are the result. Typically, calving percentages are lower than the U.S. and cattle are older when they reach slaughter weight.

Livestock markets operate reasonably well in some areas, but all could be improved with (1) More attention given to providing adequate government market services such as more timely and complete market news and supply information, (2) Extra attention by local governments to providing marketing support for small producers. This might involve organizing transportation services for livestock on market days, as well as establishing additional low cost public livestock markets with minimum facilities that might operate once a week or once a month to serve small producers who do not have direct access to an existing market.

There should be a study to improve market performance of the national market by improving the market conditions for pricing at all levels in the livestock-meat industry.

Governments should develop rules and policies that (1) Assist in decentralizing meat packing where refrigeration is feasible, (2) Improve

standards of health and sanitation at slaughter, processing plants and at retail stores.

#### ASIA - Nature of Subsector

This section is brief for several reasons. First, the author has limited field experience in Asia, second, the literature available on livestock meat marketing was limited, and third, some of the same ideas and principles covered earlier also apply in the Asian Third World.

The discussion of livestock and meat marketing in Asia must focus on the fact that most production units are very small. Mostly they are supplementary enterprises to a subsistence crop operation where the farmer may market only one or two animals per year. In this context there are some marketing techniques that appear very unusual to the Westerner such as immobilizing a pig in a wicker cage while being transported and displayed at a central market for sale. There are also some examples of large scale integrated operations in poultry and pork that rely on imported feedstuffs and/or processing plant byproducts.

Although effective demand is improving, per capita consumption of meat in Asia is lower than most of the rest of the world. The emphasis is more on pork, fish and poultry and less on beef. High income East Asia was estimated to consume 25.5 kg. in 1985. Half of it was pork and one-third was poultry. Low income East Asia was estimated to consume 15.1 kg. Again, half was pork and one-third was poultry (Table 2). In India there is very little meat consumed, but dairy products are important. In Muslim areas there is little, if any, pork eaten. Cattle and buffalo are used for power and milk and most slaughter is old animals. As Asia develops, the demand for meat and poultry will increase significantly. The experience of Japan and other higher income Asia demonstrates that. China, the world's largest pork producing and

consuming country (Compare Figures 2 and 3.) will surely try to increase pork and poultry production as income increases. A recent China survey of school and college age children and young adults showed many were undernourished and only 2 or 3 percent overweight ( Houston Post, Dec. 3, 1986). One would suspect this problem is common in most of the Third World countries in Asia. China has an estimated per capita meat consumption of 17.6 lbs. per year, 90 percent of it is pork (Hoefler and Jones, p. 2).

### Marketing

It appears that improving livestock-meat marketing in Asia should be approached from three directions:

- (1) Where there is a crop or farm supply cooperative or parastatal organization serving the producers in an area, they might consider extending their services into livestock-meat marketing. This follows the Japanese concept of the role of cooperatives, and they have been very effective in providing small producers with marketing services.
- (2) Develop specialized, integrated production-processing operations that utilize imported feedstuffs if necessary. Taiwan and Japan have had great success in this direction.
- (3) Maintain low import restrictions and permit low cost livestock feed, meat, poultry and dairy products to be imported to fill the growing demand. Since the EC has essentially closed its markets to its former suppliers of meat - Oceania and South America; these areas have had surpluses and great difficulty finding markets. If the objective is development of Third World Asia, the best economics is to give access to the areas of the world with surplus agricultural resources. If Asia would permit importation of meat and dairy products with only a low tariff, the total exports from Oceania could be marketed there (See Figure 2). This is not likely to

happen, but there should be discussions in this direction, because an optimum development path involves exploiting your competitive advantages.

#### Marketing for the small farmer

In subsistence farming areas, transportation, marketing livestock, and meat processing are sometimes rather primitive. Markets are often not specialized and have little or no facilities. Often livestock and meat are part of a central market for all types of products. National and municipal governments often operate markets, abattoirs and regulate market conduct.

In Thailand, a livestock market may simply be a meeting place for private treaty trading. In the Philippines, the Marcos regime started a series of auction markets to serve small producers. The auction system did not work because it operated too slowly, however, the facilities are being used; they were converted to private treaty trading with commission men representing each seller.

#### Future changes

There is a trend toward more public markets for livestock in the developing world. Public markets have long been an efficient way of selling small lots of non-uniform livestock. The next step for some areas where the volume is available is likely to be more specialized facilities and services, including specialized transportation services for assembling the livestock.

There is room for a substantial upgrading of marketing facilities and services at all levels. Viable projects would appear to be feasibility studies followed by pilot projects that are oriented toward more specialized marketing, processing and marketing services. As an economy moves from subsistence farming systems to a more commercial orientation, the markets should also simultaneously make the transition.

The emphasis in other sections on government services and regulations

that create a legal and economic environment for free and open competition also applies here. In some cases, however, there is a need for government to encourage and foster producer marketing organizations so that efficient volumes can be achieved.

#### SUMMARY

Livestock and meat marketing in both developed and undeveloped countries appears to have lagged that of other agricultural commodities and products. Apparently much of the reason is the complex nature of the product, its perishability, its wide variability in quality and the difficulty of producing consistent uniform retail packages of the product. In less developed economies without good transportation, communication and refrigeration; problems of livestock and meat marketing development are compounded.

There are many rather simple and inexpensive improvements that can be made in marketing and processing methods, in facilities and government policy and services. Some of them may have little, if any, perceptible impact, but the path to progress is to continue to try those methods and approaches that have been shown to be useful elsewhere. On the production side, it appears that many range and animal husbandry practices commonly used elsewhere are negated in a communal grazing setting where stocking rate is not controlled. In both production and marketing, price control negates many attempts at improvement. Dramatic improvements involve drastic changes and large projects that significantly change the system. There are few examples of sudden breakthroughs or drastic changes in the history of livestock and meat marketing in developed countries. Progress historically has been evolutionary rather than revolutionary.

In developed countries, marketing accounts for substantial value added to the product, in many cases from 30 to 50 percent of the retail price.

Apparently in developing countries it averages considerably less; however, there is wide variability. In subsistence type livestock operations where the meat is sold locally, the margin would be low, but supplying urban areas significantly increases the marketing costs.

Although it may not necessarily be the highest priority, most Third World areas could make noticeable improvements in livestock and meat marketing at modest costs to the public or private sector, especially if they are willing to examine the entire subsector and be willing to make changes in policies and government services.

Most projects would have a higher probability of success if they include provision for training programs. Both private and public activities need to consider some type of continuing training programs, especially for new employees.

#### RECOMMENDATIONS

Some Third World marketing problems may be easily assessed and one can proceed directly to working on improvements without research or a task force report. Other problems are complex, requiring careful planning and research to achieve good results. Those concerned with development should ask questions and start plans for improvement.

##### What Needs to be Done

1. Examine policies that set prices of livestock and meat. Do these provide incentives for improved production and marketing practices? Do they allow flexibility to serve different markets and different tastes with different products?
2. Evaluate government services to the marketing system. Are they adequate to protect the public health? Do they provide necessary market information at all levels in the system. Are grades and standards adequate? Are

- markets regulated to prevent fraud? Is there free entry into marketing?
3. What facilities are needed? Is there sufficient slaughter capacity to handle seasonal and cyclical peaks? Are there sufficient local market facilities to serve small producers?
  4. Available literature on livestock meat marketing is very scarce compared to production literature in the Third World. Encourage university studies and publications on improving livestock-meat marketing. Earmark part of USAID Third World graduate student support for marketing research with a requirement for publication.
  5. Develop some pilot projects on improved marketing. There has to be experimentation on the part of someone to make progress. In some cases it may be desirable to operate pilot projects that change the marketing system at some specific level or location.
  6. In pastoral areas devise programs to provide incentives for timely off-take of livestock. One alternative is to charge grazing fees to be used to improve the range and to send a signal that holding unproductive livestock on communal grazing property is not free. The fees could be used for projects to improve the range.
  7. Conduct regional short courses in livestock-meat marketing for administrators and managers from several countries. If possible tie these in with in-country training in the Third World. It is not uncommon for management of parastatal marketing companies or cooperatives to have no marketing training or experience prior to being appointed to a position with marketing responsibilities.

#### Marketing Improvements

Marketing systems the world over have the possibilities to be improved because economic systems are dynamic and are influenced by all sorts of events

including an onrush of technology. A list of potential improvements for an area as diverse as the Third World could be very long but they can be classified under four categories.

1. Marketing efficiency. involving projects designed to lower total cost. This often involves improved technology; however, improved management is critical, also. Increased efficiency may involve projects such as the feasibility of facilities location and operation — like livestock markets, slaughter plants, wholesale and retail outlets, and improved transportation and refrigeration.

2. Marketing alternative product forms and qualities to obtain a higher price. This could involve changing both the production and marketing system to produce a superior retail product. Increased quality such as faster growing, younger slaughter animals, coupled with improved marketing methods that maintain quality or enhance it by further processing.

3. Marketing policy - government and industry policies that create the legal and economic framework within which the market functions. Typically, Third World governments have played an active role in controlling both market structure (operating parastatals, restricting entry) and market conduct (controlling price, allocating supplies) with the result of rather poor market performance, in some cases, especially in the efficiency and the progressiveness dimensions.

If policies are in place that encourage private enterprise, reward innovation, and insure competition, then the industry is likely to make progress in an evolutionary fashion with few, if any, intervention programs. On the other hand, if policies do not foster open market activity and private investment, then progress generally depends on government intervention projects. In all cases, it is very important for government to maintain

policies and monitor and report performance and make available to the public the indicators of industry market performance (Farris, 1986).

#### 4. Market Services.

Inspection standards and services to assure proper sanitation and disease control are essential. Timely market information such as market news and supply information allow the market to adjust to changing conditions.

Develop and monitor grades and standards that facilitate quick and easy communication in the market. It is often desirable to develop and monitor operating rules for privately owned abattoirs and public markets. In some cases it appears necessary for governments to provide credit services, and own and operate public markets.

A market system can be operated in many ways, but all types, from free enterprise to state owned and operated, must be monitored so that the public and its representatives can evaluate its market performance. Otherwise, either private or public market operations will begin to serve interests other than the general public.

### RESEARCH PROGRAMS

The lack of published research on livestock-meat marketing leaves a wide range of research needs in the Third World. Depending on the situation, projects could range from a complete subsector marketing assessment to a very specific project such as the feasibility of a marketing or processing facility. The following categories are suggested to guide further research planning.

#### 1. Subsector marketing assessment.

If a large or long-term project is being planned, it may be desirable to first do a quick assessment of marketing of the entire subsector before all aspects of the project are finalized.

The "Rapid Reconnaissance Guidelines for Agricultural Marketing and Food System Research in Developing Countries" may be appropriate for this purpose, depending on the amount and type of research already available. A quick, informal assessment can be made much easier by the investigators observing the markets and interviewing operators, but for a large project a formal assessment study can provide the specific programs that follow, depending on findings of this assessment. They could involve any or all of the following, listed roughly in order of scope from comprehensive to more narrow projects.

2. Analyses of the Market Structure, Market Conduct and Market Performance.

Many of the marketing problems in the Third World are a result of there being no deliberate attention to what is required in terms of laws, rules and regulations to create an environment to achieve good market performance. Open markets under free enterprise do not operate well unless government has policies in place that maintain competition and protect the right of relatively free entry into the business. It may also require a credit program for this right to be viable where there has been a history of restricted entry.

Likewise, a market system managed or dominated by price control or a parastatal may not perform well unless performance is monitored and policies are designed to provide incentives for good performance. At the very least, prices and margins in other countries should be compared as a first rough evaluation. Generally, when any agency group or parastatal is protected from foreign and domestic competition, one can expect market performance to decline.

A comprehensive comparative market performance study of several

countries in a Third World region would be useful to establish a basis for considering policy changes to improve market performance.

3. Analyze Alternative Pricing and Marketing Policies to improve development.

A common problem in the Third World is that prices are often controlled to achieve goals such as a transfer of income. This distorts quality incentives as well as reduces incentives to adopt improved marketing practices. Research that would estimate the impact of alternative policies on development in the livestock-meat subsector would be useful for designing price policy to encourage development.

4. Evaluate the Impact of Alternative Government Services on Development.

For a market system to perform well a variety of government services are needed -- from operating public markets to developing and offering grading services, inspection services and enforcing rules that prevent fraud in livestock transactions.

5. Small Stock Market Development Analysis

It appears that small stock will become a larger portion of the meat diet especially in Africa. Increased production may require new slaughter facilities, public markets and wholesale distribution systems. In some cases educational programs may be required to promote acceptance and efficient use of sheep and goat meat.

6. Feasibility of Integrated Broiler and Pork Operations in Asian Third World.

Low income Asian countries have the lowest per capita consumption of meat and poultry. Urban areas could be supplied pork and poultry from integrated operations using imported feed grains. The

feasibility of such operations needs to be estimated, especially the effective demand, however. Japan and Taiwan have been quite successful with this type operation.

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Comments on the Paper —  
"Improving Livestock and Meat Marketing in the Third World"  
Author of Paper: Donald E. Farris  
Reviewer: Harold M. Riley

The paper stresses the differences between livestock and meat systems in more developed and less developed countries and then traces the long-term historical development of the U. S. system, calling attention to the central importance of technological advances in transport, refrigeration, mechanized processing and communications, undergirded by a relatively stable political-economic environment and reliable government services, such as market information, product grading and sanitary inspection. All of this facilitated the development of an efficient system of pricing, buying and selling of livestock and meat products.

It is stated in the paper that the developed country system has been and will continue to be transferred to Third World Countries--but that certain basic conditions--infrastructure, legal and economic framework and effective product demand must exist for the system to operate effectively.

Now that's a tall order, since these conditions don't exist and aren't likely to evolve very soon in most Third World Countries, especially in Africa.

The preliminary identification of problem areas and constraints that appear early in the paper points to so-called inadequacies when viewed against more modern, advanced systems.

The description of livestock and meat subsectors by regions of the Third World provides useful descriptive assessments and identifies significant problem areas. In the African section the diversity of conditions among countries is brought out and the critical importance of resource degradation due to overgrazing, the prevalence of diseases, insects and predators are cited as major production-related problems contributing to very low levels of productivity. Price controls are identified as one of

the more important disincentives to expanding production and to the production of higher quality meat animals.

I was pleased to see the recognition of the relative importance of small ruminants (goats and sheep) in the livestock subsector and the need for better marketing methods for these animals. But achieving these conditions is apparently complicated by the uneven flow of these animals into markets that are related to climatic conditions and the need to convert this form of wealth into cash for food, other necessary consumer goods or for ceremonial purposes. It's clear that the small ruminants play an important role in the food security of rural residents.

In drawing on previous African studies I was surprised not to see more utilization of the studies by the Center for Research on Economic Development at the University of Michigan which were carried out in the Sahelian zone. These were carefully conducted descriptive, diagnostic investigations that shed considerable light on the actual operational characteristics and the performance of existing marketing systems. Interestingly enough, the authors of the CRED judged the system of livestock marketing to be operating rather effectively and at reasonable cost levels, given the conditions over which the private traders have little control, e.g. infrastructure, government price controls and basic resource conditions. Even the informal information system appeared to be working well in transmitting information from major livestock markets back to assemblers located in the more distant areas of production. Treking was also judged to be generally cost effective as compared to alternative means of transport.

In describing the Latin American livestock and meat subsector the paper makes a useful distinction between the more modern marketing systems orienting towards export as contrasted to domestic meat systems characterized by slaughter, wholesale and retail distribution without refrigeration. As in Africa, retail meat price controls are cited as a disincentive to the possible adoption of improved marketing methods. Export taxes are

also cited as having a similar disincentive effect. Farris suggests that the role of government should be to develop rules and policies to assist in decentralizing meat packing where refrigeration is feasible. I question the economic feasibility of this recommendation in many of the developing countries situations. We are aware of many underutilized white elephant slaughter plants that have been built in poor locations and with very expensive equipment including refrigeration.

I found the description of the Asian livestock and meat system to be relatively underdeveloped, and for that reason will turn to my reactions to the recommendations pertaining more directly to the broader objectives of this seminar.

First, regarding problem identification and areas that should be given greater prominence. In Africa, I believe more attention should be directed to the role of livestock in basic food security and in longer-term agricultural development. This should be accompanied by diagnostic, prescriptive assessments of both input and livestock marketing. A better understanding of the role of livestock in providing food, draft power, manure, fuel, etc. while utilizing resources not readily converted into other useful outputs is needed.

Second, I would like to see the basic approach to a research agenda brought together in a more comprehensive subsector framework that can be adapted to particular country situations. In that regard our discussion of rapid reconnaissance guidelines should be useful in suggesting such a framework.

Third, we need to be thinking about long-term problem solving, applied research combined with an in-service training, policy dialog and institution building within countries. There seems to be support for this approach within AID, but the process is not facilitated by existing administrative procedures. I am referring particularly to the need for continuity and sustained effort to achieve major develop goals.

Fourth, although as indicated in the paper's summary, "...there are many rather simple and inexpensive improvements that can be made in marketing and processing methods in facilities and government policies and services." However, I would caution that these proposed improvements may require careful assessments and well conceived system compatible approaches to ensure successful adoption.

Fifth, where major facility investments in slaughterhouses and market facilities are being considered, it is particularly important that realistic feasibility assessments be made so as to avoid repeating some of the mistakes that are still around to illustrate what can go wrong without adequate planning and follow-up implementation efforts. As will be emphasized by others in this workshop, we need to be careful not to overdesign modern institutions and facilities.