

IICA Office in Barbados
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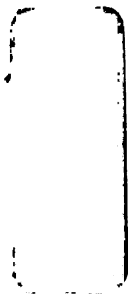
Ministry of Agriculture
and
Natural Resources

BARBADOS INTEGRATED LIVESTOCK PROJECT

IICA
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Barbados
April 1986

MEMBERS OF THE
COMMISSION
OF THE



MINISTRY OF AGRICULTURE
AND NATURAL RESOURCES

INTERAMERICAN INSTITUTE FOR
COOPERATION ON AGRICULTURE

**DOCUMENTO PRELIMINAR
EN
CONSULTA**

INTEGRATED LIVESTOCK
PROJECT

VOLUME 1

CHAPTER I
CHAPTER II

Barbados, March, 1986

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GLOSSARY

ACB	Agricultural Credit Bank
AHS	Animal Health Services
AI	Artificial Insemination
ANU	Animal Nutrition Unit
APU	Agricultural Planning Unit
BADC	Barbados Agricultural Development Corporation
BMC	Barbados Marketing Corporation
BNB	Barbados National Bank
BNSI	Barbados National Standard Institute
BARPAC	Barbados Packers and Cannery Limited
BAS	Barbados Agricultural Society
BASIS	Barbados Agricultural Society Information System
CAO	Chief Agricultural Officer
CARDI	Caribbean Agricultural Research and Development Institute
CBB	Central Bank of Barbados
CDB	Caribbean Development Bank
CLS	Central Livestock Station
DCAO/ED	Deputy Chief Agricultural Officer/Extension and Development
DDC	Dairy Development Committee
ILP	Integrated Livestock Project
LDC	Livestock Development Committee
MANR	Ministry of Agriculture and Natural Resources
MCICA	Ministry of Commerce, Industry and Consumer Affairs
MFP	Ministry of Finance and Planning
MS	Meteorological Services
NAAC	National Agricultural Advisory Committee
PEC	Project Executive Committee
PEP	Project Execution Plan
PIU	Public Investment Unit
PMAC	Programming and Monitoring Advisory Committee



PPC Planning and Priority Committee
PS Permanent Secretary
PSSA Permanent Secretary for Special Assignments
SAO Senior Agricultural Officer
SIAB Sugar Industry Agricultural Bank



CHAPTER I

SUMMARY



CHAPTER I

SUMMARY

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I. SUMMARY

1.1 The Borrower and the Executing Agency

The borrower for the Integrated Livestock Project will be the Government of Barbados through the Central Bank of Barbados.

The Executing Agency will be the Ministry of Agriculture and Natural Resources, through its Deputy Chief Agricultural Officer for Extension and Development. Nevertheless, the implementation of it will require the active and orchestrated participation of the Prime Minister's Cabinet, and of the Ministry of Finance and Planning (Projects Investments Unit) and of the Ministry of Commerce, Industry and Consumers Affairs (Licensing Review Committee and Price Control Division).

1.2 Objectives of the Project

The General Objective of the Project is to reduce the import bill of milk, beef, mutton and animal by-product through the increase of local production of milk, beef and mutton. It will simultaneously direct into productive use increasing underused resources such as marginal agricultural land and human resources



The specific objectives of this project which are expected to contribute to the ultimate goal are the following:

1.2.1 Increased Production of Meat and Milk

Substantial increases in the domestic production and consumption of fresh milk, and quality beef and mutton, so as to substitute for imports and reduce the drain on foreign exchange.

1.2.2. Increased Productivity of Dairy/Beef and sheep Producers.

A marked improvement in the efficiency of production of dairy farmers and small holders sheep rearers.

1.2.3. Efficient and Effective Marketing Systems for Meat and Milk

Substantial improvements in the physical and service infrastructure for the marketing processing and distribution of the domestic livestock product.

These objectives are well in line with the goals and strategy defined in the 1983-1987 Agricultural Development Plan:



- (1) To optimize the agricultural trade balance by increasing agricultural export earnings and reducing agricultural (food) imports to the extent that these are technically, economically and socially acceptable;
- (ii) To improve farm income as means of raising the standard of living of the agricultural community and to enhance the nutritional status of the community at large;
- (iii) To stabilize the agricultural employment trend and as far as possible make the sector an effective contributor to employment generation;
- (iv) To improve the level of efficiency in the sector especially at the administrative (institutional) and farm levels;
- (v) To conserve land and water resources and create the conditions for their efficient utilization; and
- (vi) To achieve more balanced growth in the agricultural sector by intensifying the



diversification effort and by strengthening the capacity of the Ministry of Agriculture to realize more effective control over both sugar and non-sugar agriculture.

The main strategy selected is that of diversification from sugar cane, while improving the current yields of the crop. An important role within this strategy is assigned to the promotion and support of mutton and beef production in order to substitute, at least partially, the imports of these. Attention will be paid to the small farmers, while preventing the unnecessary fragmentation of land. In fact the Government has embarked on a Rural Development Project, with financial support of the Inter-American Development Bank, which aims at developing plantation tenancies and small farmers as viable entities. It has also implemented the Land-lease Project (also with financial support from the IADB) which aims at leasing land to full-time farmers.

As mentioned before, import substitution is a pivotal area in the strategy selected by the GOB, and several elements are pointed out in the 'Plan', including, among others:- pricing policy, import fees, import controls, reorganization of non-sugar marketing and the development of Agro-Industries .

1.3. Project Components and Project Costs

The Integrated Livestock Project has been devised with the following components:



- Marketing and Processing
- Animal Health
- Research
- Supportive services (extension, credit and artificial insemination)
- Technical cooperation for the implementation of the project.

Table I-1 summarizes the estimated total costs of the project, detailed by project component. Four years have been considered for the project disbursement period.

The marketing and processing component will demand some 2.2 million Barbados dollars for the construction and equipment of the abattoir complex . The service centers will demand a minor investment of some B'dos 285 thousand. The rest of the costs are due to operational expenditures. In all, it represents some 16.6% of the total costs for the investment period.

The animal Health Component will demand only a marginal investment of B'dos \$ 460 thousands (some 1.1% of total) while the research and extension component will demand a little over B'dos \$ 2.9 million or 7.0% of the total.



Technical cooperation costs add to 1.3 million (3.2%), of which the consultants' bill adds up to B'dos \$ 1.1 million.

At the farm level, is where the bulk of the costs for the investment period lie, 72.1% of the total. The reason being the heavy investment required for the development of the beef/dairy industry. It should be borned in mind that the strategy of the project calls for the creation of new farms, and the importation of breeding animals for building up the stock.

1.4. Financial plan

It is proposed that the project be financed in the following way: 50% by the IADB, 15.7% by the Government of Barbados and 33.8% by the farmers. Table I-2 presents the details of financing sources, by year. The total amount of money to be borrowed to the Bank adds to almost US\$ 11 million.

1.5. Project Implementation

Implementation of the project will require two distinct levels of involvement of the public sector, a policy making and regulatory functions on one hand, and project execution on the other.



At the private sector level, the involvement will be quite important since it requires the running of the abattoir and meat processing facilities, a key element in the whole strategy devised.

1.6. Project Beneficiaries

Direct beneficiaries of the project will be the dairy and beef farmers of Barbados participating in the project, as well as the landless/small holder farmers who are the main sheep keepers in the island.

1.7. Technical cooperation required

Two types of technical cooperation have been considered, training of local technicians and personnel and expatriates to start operations of research and abattoir, while local personnel is being trained. In total, there will be some 80 person-month of formal training and 105 person-month of consultancies.



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE I-1
ESTIMATED TOTAL PROJECT COSTS
 ('000 B'dos \$)

PROJECT COMPONENT	1		2		3		4		TOTAL		GRAND TOTAL
	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	
I. MARKETING & PROCESSING	1645.4	989.6	43.9	1380.6	54.4	1386.3	56.6	1389.1	1800.3	5145.6	6945.9
II. ANIMAL HEALTH	119.1	68.6	57.8	68.6	5.8	68.6	5.8	68.6	186.5	274.4	462.9
III. RESEARCH & EXTENSION	569.3	569.5	216.9	549.3	58.8	479.3	66.2	403.3	911.2	2001.4	2912.6
IV. TECHNICAL COOPERATION	679.0		486.0		147.0		15.0		1327.0	0.0	1327.0
V. FARM LEVEL	2590.4	1189.1	3668.3	2437.4	5129.9	4377.5	5097.9	5411.1	16486.5	13415.1	29901.6
VI. TOTAL	5603.2	2816.8	4472.9	4435.9	5395.9	6311.7	5241.5	7272.1	20713.5	20836.5	41550.0

SOURCE: IICA/MANR-I.L.P.



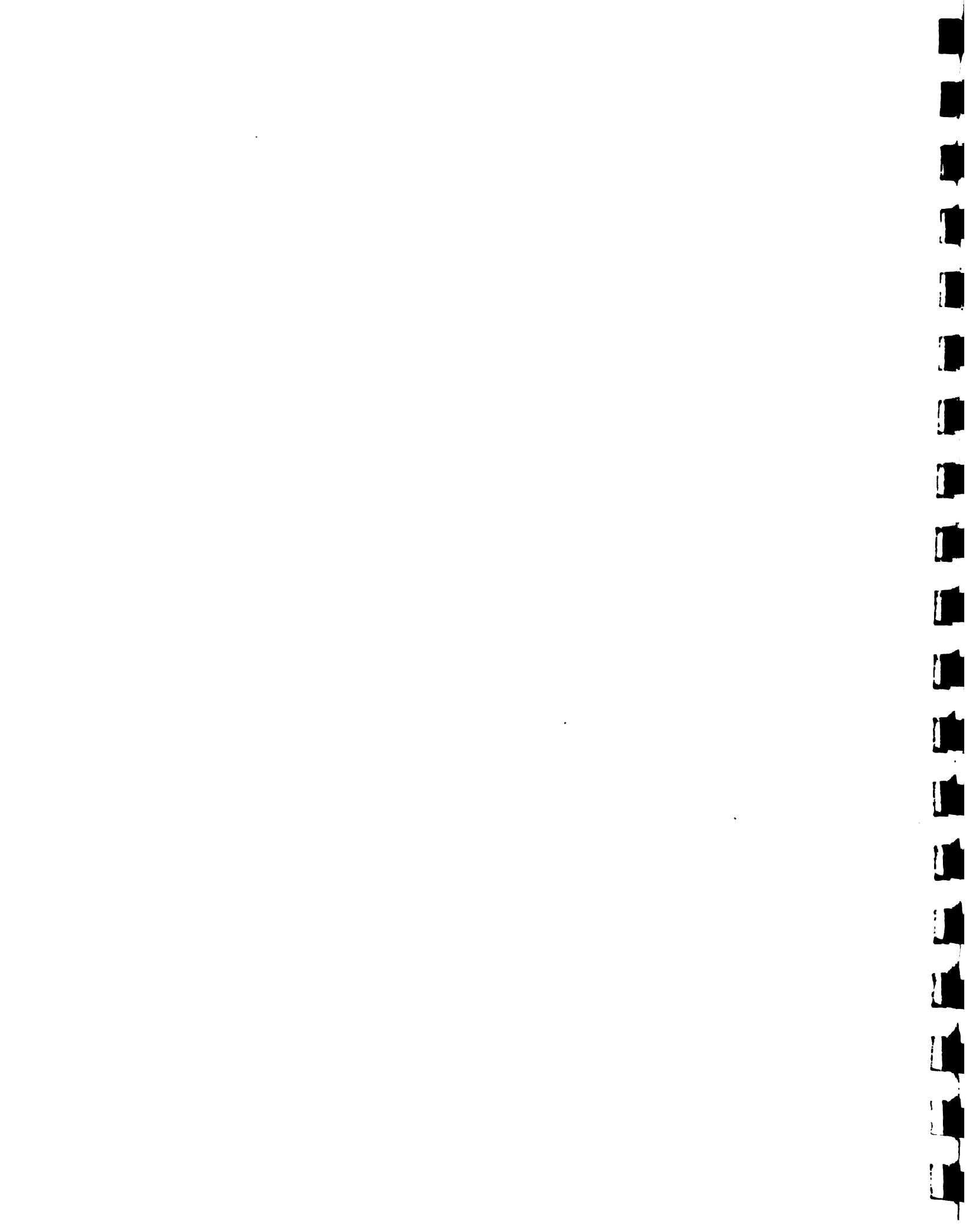
BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE I-2
FINANCING BY SOURCES
 ('000 B'dos \$)

CONCEPT	1			2			3			4		
	IADB	GOB	FARMERS	IADB	GOB	FARMERS	IADB	GOB	FARMERS	IADB	GOB	FARMERS
I. MARKETING & PROCESSING	2500.4	134.6	0.0	43.9	1380.6	0.0	54.4	1386.3	0.0	56.6	1389.1	0.0
II. ANIMAL HEALTH	119.1	68.6		57.8	68.6		5.8	68.6		5.8	68.6	
III. RESEARCH & EXTENSION	569.3	569.5	0.0	216.9	549.3	0.0	58.8	479.3	0.0	66.2	403.3	0.0
IV. TECHNICAL COOPERATION	679.0	0.0	0.0	486.0	0.0	0.0	147.0	0.0	0.0	15.0	0.0	0.0
V. FARM LEVEL	1762.8	0.0	2016.7	3583.1	0.0	2522.6	4895.0	0.0	4612.4	5627.8	0.0	4881.2
VI. TOTAL	5630.6	772.7	2016.7	4387.7	1998.5	2522.6	5161.0	1934.2	4612.4	5771.4	1861.0	4881.2

SOURCE: IICA/MANR-I.L.P.



TOTAL			GRAND
IADB	GOB	FARMERS	TOTAL
2655.3	4290.6	0.0	6945.9
188.5	274.4	0.0	462.9
911.2	2001.4	0.0	2912.6
1327.0	0.0	0.0	1327.0
15868.7	0.0	14032.9	29901.6
20950.7	6566.4	14032.9	41550.0



CHAPTER II

BACKGROUND



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II. BACKGROUND

2.1 GEOGRAPHY OF BARBADOS

2.1.1. TOPOGRAPHY

Located between latitude $13^{\circ} 02' N$ $13^{\circ} 20'$ and longitude $59^{\circ} 25' W$ and $59^{\circ} 39' W$. Barbados is a small island of 430 square kilometers (166 miles) measuring 33.8 km (21 miles) by 22.5 km (14 miles) .

Topographically, the island is relatively flat except for the Scotland District in the north-east (see figure II-1). The St. Lucy Tableland, a stretch of gently rolling country rising approximately 60 m (200 ft) above sea-level, lies to the North. From the western, north-western and south-eastern coastlines, the land rises towards the centre of the island in a series of terraces. From the south-western coastline, the land rises to just over 91 meters (300 ft) - the Christ Church Ridge, which gently descends to the St. George Valley before it rises northwards to the Central Uplands. The St. Philip Tableland, a flat expanse of land, lies to the southeast of the Central Uplands. In the east and northeast is the Scotland District. Here



the land rises very abruptly from the coastline, and is high and rugged consisting of many valleys separated by steep-sided ridges. It is from the Central Uplands that Mount Hillaby 335m (1 100 feet), the highest peak on the island projects.

2.1.2 CLIMATE

Barbados has a relatively even climate tempered by the prevailing north-east trade winds of around 10m.p.h. The island has a distinct wet and dry seasons. Generally, the wet season starts from the beginning of June and goes through to mid-December when the dry season begins, ending at the end of May. The volume of rainfall in the wet season depends on the frequency of tropical disturbances. March is usually the driest month. The last ten years average rainfall on the south was 1162.8 mm (45.8 ins) and approximately, 2158 mm (85 ins) in the high areas of the Scotland District.

Temperature variation is small from place to place and from month to month, but diurnally can reach up to 10°C (50°F). Surface temperatures vary between 20°C (68°F) and (88°F). In the dry season there is 72% insolation which drops to 64% in the wet season. Humidity varies between 62-72% on the average.



2.1.3 SOILS

In Barbados there are three main soil types. (see figure 2). Along the north, west and south coast of the island, the soil is black, deep and very fertile, although along the south coast the soil tends to become rather shallow and dry. In the centre of the island lie red soils of moderate fertility. The Scotland District contains soils of the poorest nature, highly subject to erosion.

2.1.4. WATER RESOURCES AND DRAINAGE

Most of the island consists of coralline limestones, a porous rock seated on impervious clay which is about 300 feet thick. In the Scotland District the rocks consist of clays, sandstone and shales and it is only in this area of impermeable rocks that there is natural surface drainage. Elsewhere "sucks" or holes which carry rainwater through to the permeable coral are the main methods of drainage.

The water supply of Barbados comes from underground reservoirs and rivers. The underground reservoirs consists of water stored in the small pores and the larger openings in the limestone coral below and above sea level.



In Barbados, all underground water supplies are derived from rainfall which goes through the top-soil and coral rock and is stored there. It is estimated that 29% of rainfall is thus collected, the rest is lost as surface run-off.

Barbados has one of the purest water supplies, chlorine being the only chemical used in its purification. Its only draw-back is that the water can be described as moderately hard since, as the rain passes through the coral, it dissolves calcium and magnesium compounds.

All areas in Barbados are well served by the water supply system and most, if not all of the holdings in the island have access to water supplies, either directly or through nearby public stand-pipes.

2.2 GENERAL ECONOMIC BACKGROUND

The economy of Barbados as a whole has performed very well over the past ten years as measured by GDP growth and GDP per capita. In constant terms, the GDP increased from B'dos \$626.9 million 1/ in 1975 to B'dos

1/ 1US\$ = BDS\$2

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\$779.4 million in 1984 (see table II-1). Growth of GDP was steady until recession hit developed countries in 1980 which meant a decrease in tourist arrivals. Loss of revenues from sugar (due to import quotas in the USA and decline of world prices) and from tourism meant the decline of total earnings of the country. This tendency seems to have reversed in 1984.

A judicious management of the economy and the capacity to grasp the opportunities that the external sector offered, coupled with a very low growth rate of the population (.2%), have resulted in a very high per-capita income. In constant terms (1974=100) in 1984, per capita income was of little over US\$1500. At current prices the per capita income in 1984 was in the order of US\$3.1 thousand (see table II-2).

In terms of the external sector, Barbados has suffered a chronic negative balance of trade, and the situation has worsened over the period under analysis. In 1975 Barbados imported over B'dos \$437 million and exported the equivalent of B'dos \$216.5 million (see table II-3). In 1984 those figures were B'dos \$1324.6 million, B'dos \$784.4 million.



In table II-4 the relationship between the export earnings generated by Barbados and the external debt and debt services of the island are presented. It can be seen that the total external debt amounts to less than half of export earnings and that the debt service generated by that debt peaked in 1982 when it reached 18% of export earnings, while in 1982 it was only 12% of the foreign exchange generated by the island.

2.3 THE AGRICULTURAL SECTOR

There are different ways to look at the sector as a whole and to put it into perspective with the rest of the economy. The most common one is to measure its importance in terms of its contribution to the GDP. Table II-5 presents the contribution of different sectors of the B'dos economy to the total production of the country, in constant terms. It can be seen that the contribution of sugar decreased from a little over B\$51 million to some B\$42 million between 1977 and 1984, respectively. Non-sugar agriculture and fisheries in the same period increased by almost a million Barbados dollars. Unfortunately, it is not easy to disaggregate the contributions of agriculture and fisheries. In



relative terms, the contribution of agriculture as a whole has remained fairly constant over the ten year span, since it represents some 10.5% of the total GDP in 1975 and 9.6% of total GDP in 1984. What has happened is that non-sugar agriculture and fisheries have off-set the decline of sugar in the participation of this indicator. In relative terms the contribution of all other sectors has also remained fairly constant with an increase in tourism and transportation and a significant decrease in the participation of Government services.

Because of the structural and geographical characteristics of the country, Barbados is highly dependent on the external sector for its development, and so another way is to measure the importance of the primary sector, and within it the importance of sugar and non-sugar agriculture, in terms of their contribution to foreign exchange earnings. In using this indicator, the tremendous decline of agriculture as a whole can be seen. Total foreign exchange earnings have increased dramatically in the ten years under analysis, from B'dos \$178 million to over B'dos \$580 million in 1984. In the meantime earnings from the sugar sector (includes sugar, rum and molasses) have declined from B'dos \$111 million to B'dos \$72



million after peaking in 1980 at B'dos \$124 million. (These figures are in current dollars). In the same period the foreign exchange revenues stemming from the non-sugar agriculture and fisheries increased from B'dos \$10 million in 1975 to B'dos \$17 million in 1984. (see table II-7).

If these figures are put in relative terms the decrease in the participation of agriculture in the generation of foreign exchange is really dramatic since it has dropped from 68% to 15% of total domestic exports in the same period (see table II-8).

Sugar represented in 1975 over 62% of total domestic exports while in 1984 it was only 12%. Non-sugar agriculture accounted for 5% of exports in 1975 and only 3% in 1984. the most important change in the contribution to domestic exports is represented by the increase of electronic components which has increased tenfold during the period.

In the meantime, the food import bill of Barbados has increased from less than B'dos \$100 million to more than B'dos 150 million, in the same period (see table II-9).



In relative terms the demand for foreign exchange for the import of food has decreased, from 21% in 1975 to 12% in 1984 (table II-10), but nevertheless still is one of the most important components in the total import bill, leaving ample room for substitution, in pursuit of decreasing the negative balance of trade.

When the value of imports is analyzed in constant terms utilizing the GDP deflator, the value of food brought into the country actually decreased while other imports, most of them of manufactured origin, actually increased (see table II-11).

Of the total food import bill, beef imports represent, roughly 10%, while total beef and beef products represent between 14%-16% of total imports. (table II-12).

The value of beef imports, at current prices (table II-12) has increased significantly during the period under analysis. It went from B'dos \$10 million in 1975 to nearly B'dos \$19 million in 1984. The physical volume of imports in the same period has actually dropped appreciably from 3.7 thousand metric tons in 1978 to 2.1 thousand metric tons in 1984.



Mutton, although imported in smaller amounts than beef, has significantly increased during the period, having reached over 1300 metric tons and B'dos \$48 million in 1984 from 500 metric tons in 1975 (table II-14).

The analysis of the imports of pork and pork products is not easy due to the changes in nomenclature by the customs authority. Nevertheless, from the study of tables II-15 and II-16 it can be seen that except for pork meat there is an overall decrease in the import value of pork and pork products. This is because, while there has been growth of local supply of pork meat and for the latter to the fact that processors have substituted the imports of processed pork, an increased the demand for pork meat for processing since local supplies do not satisfy their needs in terms of both, quantity and quality.

Finally, imports of dairy products have also increased substantially over the 10 year period under review. In 1975 Barbados imported some B'dos \$7.3 million worth of dairy products, a figure that has increased to B'dos \$12.0 million in 1984. Half of this value corresponds to milk and cream imports, a



third corresponds to cheese and the rest to other products such as butter, ghee and other fats (table II-17 and II-18).

2.4. LIVESTOCK AND LIVESTOCK PRODUCTION

2.4.1. General

Over the years the livestock industry in Barbados developed in response to local demand for fresh meat and milk. This development however, has not been intense nor consistently organised, but tended to be spasmodic and ad hoc.

Animal rearing, especially by small and "Landless" producers was regarded as a saving or for home consumption, rather than an economic commercial endeavour. Commercial production prior to the late 1960's was rare, and the small-to-medium "backyard" operation was the norm.

The estates were required by law to keep a minimum number of livestock while it was common for most rural householders to have one or two head of livestock or to raise certain livestock species for specific festive seasonal holidays.



The basic structure of the livestock industry, except for poultry production, has changed very little from the early days. The diversification programme introduced in the 1960's after independence, has resulted in waves of interest in various livestock endeavours, depending on incentives, potential markets and in many cases "curiosity" producers looking for quick cash.

In the 1971 Agricultural Census (the latest), there were 7 thousand head of cattle reported, a little over 27 thousand head of sheep and over 5 thousand goats in Barbados (table II-19).

It will be seen that the high concentration of animals in general, and of sheep and goats in particular are in the smallest and 'landless' farmers strata. In the case of cattle, 70% of the total number of heads reported were on holdings of 5 acres or less and 30% were in the hands of so-called "landless" farmers. In the case of sheep, 96% of the total were on holdings of less than 5 acres and 58% in landless holdings. Of the total number of goats 98% were on holdings of less than 5 acres while 50% were in the hands of landless farmers.



Barbados has no tradition of commercial livestock production and therefore it does not have the regulations or controls that commercial production system usually required.

Just to mention a few of these that are lacking:

- There is no control of the movement of livestock between farms or between parishes.
- There is no certificate of purchase of animals, or any other document that would indicate ownership.
- There is no brand or mark that allows that identification of the animals.

Introduction of certain of these controls would stop, or at least reduce the losses of animals which seem to be quite important. For 1971, 3% of total cattle and 6% of total sheep were "lost" in the island as reported in the Agricultural Census.

Another control that would benefit the livestock industry would be animal health controls which would allow one to trace the origin of animals if any diseases were detected.



2.4.2 Cattle

The major breed of cattle in Barbados today is the Holstein. These were brought into the island from Canada in 1973 in order to further develop the dairy industry. The cattle have been bred with semen of Holstein, Jersey and some Guernsey bulls plus, recently, a few Jamaica Red bulls. However, most of the breeding is of the Holstein type of cattle.

These cattle have proven to be very adaptable to the conditions of Barbados and are capable of producing quality beef either under a pasture plus molasses feeding system attaining market weight over 20 months on the farm or intensive full feeding reaching market in 12 months.

The usual system of beef production here is based on animals tethered on grass during the day and brought in at night for water and possibly some feed. This procedure while producing slow gains with a low quality carcass thus contribute a major portion of the total meat produced on the island. These cattle would be marketed anywhere from calves to 3 year old bulls.



In the recent past the Jamaica Red has been introduced to the island as a beef breed through one pure bred breeder. There are being used for crossing with the dairy breed to produce beef animals.

In terms of milk production, it can be seen that a significant increase occurs in moving from the 'landless' to the smaller holdings. (table II-21). Also of importance is the high contribution to milk production of the holdings with less than an acre of land, which, while having only 22% of the total number of adult dairy females, produced 69% of the total milk.

The highest concentration of cattle is in the parishes of St. Philip (15%), St. Andrew (14%) and St. Michael (11%). (see table II-22).

Table II-23 shows the distribution of adult dairy cows and milk produced in one day, by parish. St. Andrew not only has the highest proportion of adult dairy females, but also the highest production per head according to the available data.



In an attempt to determine if there is some specialization by parish, in terms of breeding, fattening or milk production table II-24 was constructed. The low numbers of animals and the lack of a more detailed differentiation of categories (particularly of males) prevents one arriving at a definite conclusion. The study of the table indicates an unusually wide difference in the numbers male and female cattle in all age groups whether dairy or not. This seems to confirm the suspicion that an important number of cattle are slaughtered in Barbados at a very young age. If that were the case, the prevention of such slaughter and the fattening of those animals would result in an important contribution to the beef supplies in the island.

Table II-20 shows the distribution of the total number of cattle, by kind and by type of farms. The average number of head per holding reporting cattle ranges from one and a half head in the 'landless' category to a little over 33 head per holding in the 50-100 acres range. It declines steadily as the size group gets bigger. The proportion of dairy to non-dairy animals is fairly constant in all size groups



2.4.3. Sheep

Prior to the mid 1970's, sheep production in Barbados was the "Cinderella" of livestock production with very little emphasis or effort being placed on the production of mutton and lamb.

Barbados is fortunately blessed with a prolific native breed: the Blackbelly. This breed evolved in Barbados through early cross breeding unadapted wool breed. Through subsequent natural and imposed selection practices over more than 300 years, the Barbados Blackbelly evolved to what it is today.

Over the years due to lack of exploitation of the genetic potential and meat producing ability, many attempts were made with various exotic, mainly wool breeds, to "improve" the meat qualities of the local sheep.

It was not until the late 1970's and early 1980's when growth trials and carcass evaluation studies were done, that it was established beyond a doubt that the local Blackbelly sheep has the ability to grow at satisfactory rates of gain and to produce acceptable and desirable, high quality carcasses.



Barbados has the potential, because of the fairly large sheep numbers, to be self-sufficient in mutton and lamb. However, despite this national advantage, conditions seemed to have prevented sheep farmers from taking up the challenge to achieve that level of production.

During the past five years the sheep industry has had many programmes that, unfortunately, have not yet been translated into any appreciable increased production because other complementary conditions have not been met.

Most of the efforts towards the development of the industry were by way of Government programmes; Among these were:

a. Multiplication Programme

At Greenland and Sedgepond Station in St. Andrew there are programmes to multiply Blackbelly sheep for sale to the public. Inherent in the multiplication programmes are selection practices to improve the breed for production characteristics.



b. Crossbreeding Programme

Parallel to the purebreed Blackbelly Sheep breeding at Greenland was a programme of cross-breeding of Blackbelly sheep with imported wool breeds (Suffolk and Dorset). This programme has subsequently been discontinued because of the great expense of maintaining breeds which were not very well adapted to a tropical environment and whose production was too low to justify.

c. Evaluation Studies

USAID - funded studies for Sheep Development Semen Evaluation and Carcass Evaluation, were carried out by US based personnel. These studies established beyond doubt the natural superiority of the Blackbelly Sheep over many other breeds in the tropical environment.

The Carcass Evaluation Studies, together with recent efforts by some local farmers to feed their animals to meet high production requirements, have demonstrated the Blackbelly Sheep can and will:



- produce meat efficiently either as a pure breed or in crossbreeding systems;
- achieve satisfactory carcass scores. In the carcass evaluation work done, sheep slaughtered from the Greenland Sheep Development Project scored 'good' to 'choice' according to USDA standards.

Commercialization within the sheep sector, therefore, is an immediate necessity.

The steps suggested in this project, if effected would allow Barbados to expand into large scale production of mutton and lamb and appreciably reduce the high food import bill.

As pointed out, in 1971 Barbados had a total of 27 thousand head of sheep, of which 10 thousand were lambs under 1 year old, and 17 thousand were all other categories above 1 year of age (table II-25). From the analysis of the data in table II-25 it can be determined that in holdings of less than 1 acre the average number



of head was around 2.7 per holding while in the 1-5 acre class, the average was 3.1 heads per holding. No difference exists in the proportion of lamb to other categories among the different sizes of holding.

In terms of the spatial distribution, the parish of St. Philip had the biggest proportion of sheep (21%) followed by Christ Church (16%), St. Lucy (13%) and St. Michael (12%) (Table II-26). Except for St. Lucy, the other parishes happen to be also the most populated (table II-27), which confirms the fact that sheep production in Barbados is not basically commercial. Some people claim that sheep are kept as a savings reservoir which may be cashed in hard times. The nature of this study does not allow for testing this hypothesis.

From the data presented, it can be concluded that, at least for sheep production, there is no specialization (breeding-fattening) either among parishes or between size groups.

If we are to consider increased mutton/lamb production we must use the Blackbelly sheep



because of their availability, and production potential, environmental and physiological adaptability, and ease and low cost of handling.

The Barbados Blackbelly sheep breed has a level of fecundity surpassed by only few other sheep breeds in the world. They lamb year round, producing on an average, 1.8 -2.0 lambs per litter. Many individuals produce at higher levels and with good nutrition ewe productivity may be better.

If bred twice in 12 months under conditions of good nutrition, it is capable of producing over 4 lambs (at 2 lambs/litter) per ewe per year. At 10% mortality at birth and 5% between birth and finishing for sale, this means 3.4 lambs sold per ewe per year. At an average finished carcass weight of 23 kg this represents 78.2 kg of carcass meat/ewe/year.

2.4.4. Beef Production Systems

Only recently has Barbados attempted to promote local beef production. At present, there is no organized system and is difficult to



obtain meaningful figures on the number and type of cattle that there are on the island. This lack of information renders impossible any attempt to accurately estimate the amount of beef produced from the existing national herd.

It is estimated that the herd of cows producing calves may have increased overall by 1% per year from 1971 to 1986. This projection seems reasonable in light of the development of a commercial dairy industry over this time. This is in contrast to the reduction of 27% in the number of cattle on the island in 1971 compared to those reported in the 1961 census. It was, however, during this earlier time that the sugar plantations were reducing their livestock operations as a part of their general farming operations.

There are today three distinct production systems in Barbados:

a. Large scale beef producers

They are of very recent development.

Their stock is either pure Jamaica Red or a



cross between Holstein and Jamaica Red. Of the former there is one farm and of the latter there are 3 farms at the most.

They all base their operation on pasture grazing with some protein and energy supplementation on a limited basis. In the case of the pure bred stock, the use of bulls in servicing cows is common, while in the other case artificial insemination is more common. The cross between the Holstein and the Jamaican Red progeny are better suited than the pure Holstein for tropical environment, while maintaining much of the productive characteristics of the Holstein breed.

Animals are usually sold at 20-24 months of age at about 400-450 kg (900-1000 lbs liveweight)

Although the number of animals produced by these farmers is not important, they do show that there is a market in Barbados for fresh meat which is willing to pay a higher price for it.



The farm carrying the the Jamaica Red pure-bred stock also sells breeding bulls for service in other herds.

b. Small Farmer Beef Production

In this category those having under 5 acres of land represent the bulk of the production. According to figures presented in Table II-19, 55% of the total number of head were on these farms. Also included in this category are the "landless" farmers who keep from one to three heads of animals on cut grass with very little supplemental feeding.

Forage usually comes, at least in part, from grass areas outside the holding. In a survey recently carried out in Barbados, almost 70% of people interviewed supplemented grazing with some form of concentrate.

When grazing is done, most farmers choose the tethered system, which simplifies the control of animals and



allows the co-existence of cattle and crops without fencing.

The age of animals sold in this group varies widely (from 20 months to several years) usually depending on the need for cash of the farmer. Animals at slaughter can weigh from 325 kgs to 550 kgs (700-1200 lbs), but carcasses might be extremely lean and tough. Males are often kept as bulls.

Most farmers in this group milk their cows for home consumption and/or selling to neighbours. Milking practices vary, half of those milking did so only once a day.

c. Dairy Production

The current commercial dairy industry of Barbados is made up of 33 dairymen who sell the milk produced from their farms to the Pine Hill Dairy. The number of animals on these farms varies from 10 to slightly over 100 head.



In general, but not exclusively, the cows are machined milked twice a day, the milk stored in bulk coolers. First prior to shipment it is transferred from the bulk cooler to churns, loaded on open trucks and taken to the dairy for sale as fluid milk.

The predominant breed as stated elsewhere is Holstein. Most cattle are pasture feed part of the year, the rest of time there feed silage, hay, greenchop or cane tops as forage sources. Until two years ago hay production was basically the only method used to store forage for use during the dry season. Since the introduction of silage making it has been used extensively by a number of dairymen.

One of the hay problems has been the feeding of inadequate amounts of concentrates to attain milk production at levels that the cattle are capable of producing. Two kinds commercial concentrates based mostly on imported ingredients are used. The main one is an 18% dairy ration and a second less popular



but more economical to use a 22% ration dairy design to be feed with molasses.

These concentrates are generally fed in the milking parlor and amounts are in relation to the milk production of the animal.

The general average level of production is about 20lbs/cow/day. Fresh cows routinely produce 50-80 lbs per day but are seldom feed for this production level thus they fall off rapidly.

Artificial insemination is used by most producers. Some live bulls are currently being used. This service reached its peak use in 1979 with 4965 inseminations and declined between 1980 and 1984. The service has since been revitalized to some extent so the trend has been reversed.

The main disease problems are mastitis anaplasmosis and babesia. Recently it has been shown that BVD, IBR and PI3 viruses were also present.



Heifer rearing has generally been done by the Greenland Station, these cattle has been undeveloped and have had a mortality rate of 20%, considerably higher than that at Central Livestock station, 7.8% in 1984.

Finding quality replacement stock is one of the problems found on the farms today. More farmers are now growing their own replacements and getting better calves as a result. The non-commercial dairy cows are usually tethered on pasture and brought home evenings for water and a minimal feeding.

The milk from these is either used by the family and/or sold to other neighbours.

2.4.5. Sheep Production Systems

In the 1960's and 1970's many attempts were made to encourage sheep farmers to increase production and thus reduce meat imports and serious consideration was given to this when the Regional Food and Nutrition Food Plan was being conceptualized. In



direct response to the need to greatly increase the numbers of breeding animals available on the island so that farmers would start a planned production phase, the Sedge Pond Sheep Multiplication Unit was established in 1976. The aim was not to supply the total need for sheep breeding stock, but to stimulate the sheep farmers to increase their production (leading by example) while injecting some worthwhile quality sheep breeding material into the gene pool.

At this time it is difficult to say what the response was to the establishment of Sedge Pond Unit. In 1976 the small (about 50 ewes) breeding flock from Six Cross Roads, St. Philip had been resited at Greenland Plantation in St. Andrew. This latter site allowed for an expanded flock size and was expected to give some incentive to the farmers to similarly increase their flock size.

In Barbados today, there are basically three main types of sheep farming enterprises.

a. Large Scale Sheep Farms

There are not many sheep farmers that can truly be considered as large scale. In Barbados breeding flocks over 100 ewes are



often regarded as large. Possibly less than ten farms exist with a breeding flock over 100 ewes.

This group of farmer have the advantage of owning or having access to land. Some of them were or are plantation owners who over the years have become disenchanted with reducing profit margins from sugar, and, in recent years, increasing losses and debts from sugar cane production.

b. Small/"Landless" Farmers

The farmers in this group, as outlined before, and as demonstrated by the 1971 census statistics, constitute the largest group in the country, thereby representing a potential that cannot be ignored or overlooked.

Members of this group are usually otherwise employed but keep sheep as a saving and for other non-commercial reasons as mentioned earlier.



As a direct consequence of the part-time nature of their sheep operation, little attention is paid to the economics of production, and as can be seen in the model of sheep production units presented in chapter III, these enterprises may be losing money or making very little. However, in their scheme of things, this is not considered to be important. Sheep are seen in this environment as a "saving box" and the money spent on feeding a sheep or two is not a cost but a saving. This "penny bank" approach to sheep and livestock keeping in general therefore is a constraint to be considered when trying to develop a progressive sheep-meat industry and ways to overcome this hurdle must be found.

In the past it has been the small farmers who have maintained some stability of sheep numbers in the country. This is particularly true because most commercially oriented sheep breeders were interested only in exports of the Blackbelly breed. The small sheep farmers therefore have



maintained the germ plasm of the Blackbelly breed in Barbados.

It is becoming apparent that because of increasing urbanisation, and perhaps too, an increased sophistication among rural dwellers, that the number of sheep and sheep-keepers within this sector may be declining. It is difficult to establish with any degree of certainty, the rate of disappearance of the rural small sheep-keeper. Unless incentives can be offered to them to continue to produce, we may see a much decreased national flock in the future.

c. Medium Scale Sheep Farmers

This third category includes those sheep farmers with 50-100 head on variable sized land. With good incentives they can engage in even larger operations.

These farmers tend to produce sheep for 'show' purposes, and to a lesser extent for meat sales and the sale of breeding



stock. This group could make an important contribution to the goal of increasing production because of (i) their easier access to credit (ii) their understanding of the value of organisation and planning of production targets, and (iii) also because they are motivated by profits.

2.5. THE MARKETING SYSTEM FOR LIVESTOCK AND MEAT

2.5.1 Supply Characteristics

Many marketing problems are related to production characteristics on the farm. In Barbados the majority of producers and a large share of livestock are found on small farms. Data presented previously is ample proof that the small producers play an important role in production. This creates an assembly problem in the marketing of these products.

Seasonal and cyclical production variations are not pronounced but the tourist trade causes variations in demand that create a problem for those in the marketing sector.



Procurement policy, price adjustments, storage and merchandizing programs are means to cope with the uneven supply-demand problem.

Production costs are high in Barbados largely because of high priced labour and land (high opportunity costs), low level of technology in production on many farms, low level of production management skills, and high costs of supplemental feeds. High production costs encourages imports of meats and creates an untenable pricing situation into the market.

The domestic supply is a small share of the total supply, hence, large percentage changes in local production will have a minimal effect on total supply

Table II-29 reports the 1984 estimated internal production, and quantities of imported meats. These figures must be used with caution because backyard slaughtering is not fully accounted for. Also the pork purchases by processors who do their own slaughtering are not accurately measured. Internal production is shown to be a small share of total supplies for beef and mutton.



2.5.2. Demand Characteristics.

2.5.2.1. Demand Components

The demand for meat in Barbados is made up of several component parts. The tourist trade demands the highest quality beef but is a seasonal demand. The resident population consume per capita per annum an estimated 14.0 Kg of beef, 5.3 Kg of mutton and 7.6 Kg of pork. (Estimates based on supplies available in 1984). In contrast incoming tourists from US and Canada consume in their home countries per capita per annum an estimated 68.6 Kg of beef 2.0 Kg of mutton, 40.2 Kg of pork. While residents from Great Britain and Central Europe consume per capita per annum 30.2 Kg of beef, 13.1 Kg of mutton and 35.6 Kg of pork. Tourists originating from other Caribbean countries consume at home per capita per annum an estimated 17.6 Kg of beef, 4.2 Kg of mutton and 13.5 Kg of pork. Although these are rough approximations they demonstrate the divergence in consumption habits. These estimates are based



on per capita consumption estimates by the FAO 1/ for selected countries plus an increment of 0.3% to adjust for higher income of tourist to Barbados. Tourist consumption estimates are adjusted to reflect meat consumption habits in countries of origin.

The demand for meat is a function of population per capita income, taste and preferences for different meats and the prices of substitute products. Normally there is a close substitution ratio among the meats. This cross elasticity is almost impossible to estimate in Barbados because of special pricing customs in certain channels. For example, the price is identical (BDS\$3.50 per lb) for beef, pork and mutton and also for each and every cut sold by the butchers at the Cheapside and Fairchild public markets.

1/ Fern, M. G., Marketing Livestock and Meat, FAO Rome 1977.



Imported meats are priced by type, cut and quality and these price differences carry on to the supermarkets. Prices of local meats in the country show limited differences by type of animal or quality.

It can be assumed with reasonable assurance that consumers do shift purchases among various types and qualities in response to price relationships when given a choice, notwithstanding the strange pricing custom at the public markets for fresh local meats.

Consumers may have a preference for fresh unfrozen meat, or frozen cut and wrapped or processed meat, but a measurement of this preference is not reliable because they are seldom able to make a clear cut selection. At the public markets only fresh meat is offered and the butchers strongly contend that consumers prefer meat in this form. However, most supermarkets offer only frozen, cut and wrapped meat and strongly contend that consumers prefer the frozen form. Two supermarkets offer a limited supply of fresh, non-frozen meat and report that their limited supply moves quickly.



It is clear that the majority of meat supplies are sold in the frozen, cut and wrapped form without consumer resistance. A rather limited number of high income consumers will pay a premium for high quality fresh unfrozen meat at the supermarkets. A completely different demand is manifested by lower income consumers who prefer unfrozen fresh meat found at the public markets.

The preference for processed pork, hams, bacon, sausage and other products is competitive with other pork cuts and other types of meat but the competition is not so close as among non-processed meat cuts.

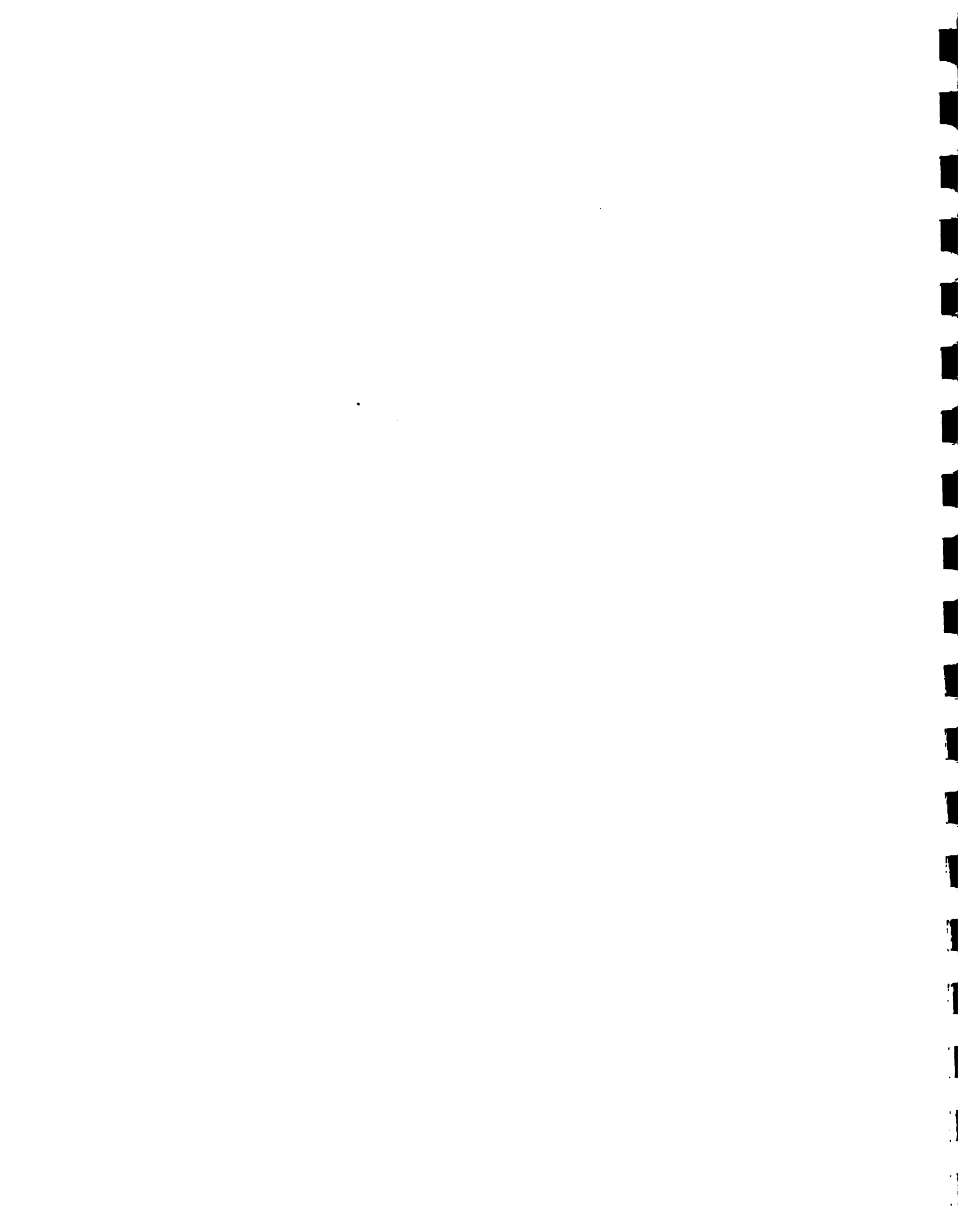
Beef and mutton are imported without quantity or quality constraints but with tariff charges. Pork, on the other hand, can only be imported by processors for further processing purposes.

The tourist visitors stay in Barbados on the average slightly less than eight days. Their presence is equivalent to 3.32% of total island population and thus evaluated as of minor



importance, but tourists have very high meat consumption characteristics, particularly for high quality beef. This demand represents about 12.1% of all beef imports and about 11.15% of total beef supplies. They do not represent a different demand for mutton. Their consumption of 3.5% of total supplies is about the same percentage as they represent in the total population. Their pork consumption is estimated at 13.77% of total supplies.

In the following table estimates of tourist per capita consumption (on a full year equivalent), are compared with the resident per capita consumption in Barbados.



	Estimated Tourists' Consumption (1)	Local Population Per Capita Consumption (2)
Beef	46.5 (kg)	14.0 (kg)
Mutton	5.6	5.3
Pork	31.4	7.6

SOURCE:

- 1) F.A.O. Per Capita estimates by country adjusted by income level and make-up of tourists.
- 2) Total supplies available less what is assumed to be consumed by tourists divided by resident population.

2.5.3 Demand Projections

Projections must be viewed as rough estimates until more reliable statistical data are available.

A simple projection equation includes growth of population, changes in per capita real income and growth in tourist trade. Changes in consumer taste are long term influences so they can be neglected for



short term projection. Price changes for substitute products related to changes in consumption, cannot be anticipated from available data.

Population statistics based on complete census usually are reliable but the added factor of out migration makes projections less than perfect. A fourteen year population growth average of 0.378% seems extremely conservative.

Income changes for the last nine years show increases and decreases from year to year, but the simple estimate of 2 to 3% may be representative for an annual growth figure.

With over 367,000 tourists per year coming to the island they represent a demand factor worth accounting for, especially for beef. Tourism has grown at an annual rate of 6% over the last ten years. Tourist numbers are adjusted to a full year equivalent per capita consumption adjusted up by a factor of 3.3 for beef and 3.0 for pork to account for their higher per capita consumption.



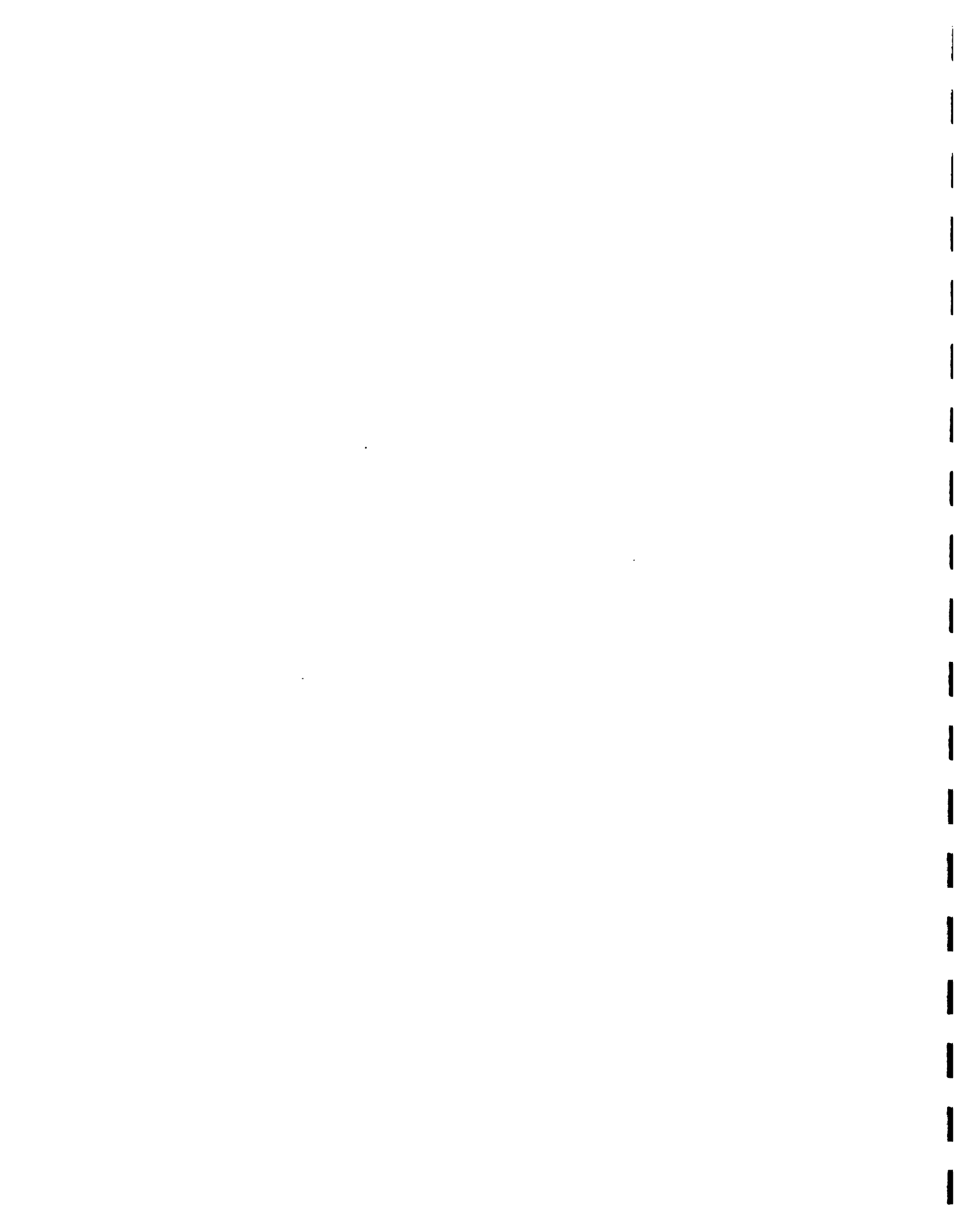
Assume:

Population growth per year	0.378%
Income growth per year	2.350%
Income elasticity for beef	1.20
Tourist growth rate	6.0%
Adjustment factor for converting tourist numbers to full year equivalent	0.0236
Beef adj. factor for per capita consumption of tourists over domestic	3.3

Hence:

$$\begin{aligned}
 D &= 0.00378 + 0.0235 (1.2) + (0.06 \times 0.0236 \\
 &\times 3.3) \\
 &= \underline{3.66\%} \text{ annual growth in demand for beef.}
 \end{aligned}$$

The same factors are used for mutton projections except the per capita consumption factor for tourists which is held at 1. The projected annual growth for mutton is 3.34%. The same factors are used for pork except the income elasticity is held at 1.0 and the per capita tourist consumption factor is 3.0. The annual growth for pork estimate is 3.62%. These estimates can be adjusted up or down as better data permit improved factor estimates.



2.5.4. Established Marketing System.

The present marketing system of livestock and meat in Barbados is a mixed system combining elements of the competitive model with the administered model. Because the import market overshadows the total market and because imports, prices, tariff and permits are greatly influenced by government policy, a market assessment analysis must relate to the institutions and interventions.

There is evidence of special market conditions that affect the market structure. Market dominance by some participants is highly probable. The case of the 33 milk producers who have a monopoly of the milk flow to the dairy and the single monopolist dairy are cases in point. Others include egg marketing, livestock feed manufacturing and distribution and large wholesale meat importers to some degree. In a relatively small total market situation somewhat isolated from other markets it is not surprising that market dominance, price leadership and restricted entry are found.



2.5.4.1. Market Information

A market information system is almost totally lacking. Because the total market is small a great deal of information is communicated informally. Marketing participants who must adapt a variable and uncontrolled flow into the market to a rather constant demand requirement can benefit substantially from improved market news.

2.5.4.2. Official Grades and Standards.

There is no official grading system for livestock products in Barbados. Quality variations are recognized by many market participants but not all. A general practice of single pricing in the country is evident. Speculators and butchers are paying the same price for animals in the country regardless of quality. However, they do require at least a minimum flesh covering and do discount those animals not meeting that standard. Unfortunately, price adjustments are not usually made as quality improves above those minima.

At the public markets a complete disregard for quality of meat is customary. The same price (Bds\$7.70 per Kg.) is charged for every cut, quality and type of meat.

2.5.4.3. Marketing Channels.

Figure II-4 diagrams the channels of the market for livestock and meat. Some variations can be noted for pork particularly. The processors buy pork directly from farmers mostly, but buy from speculators and butchers to a lesser extent. They do not buy beef or mutton on the local market. Processors are slaughtering some of the swine purchased (one of the three firms) and rely on the BMC's abattoir for custom slaughtering also.

The position in the marketing channel of the BMC's abattoir is crucial to the marketing of livestock, not as a price making centre because ownership does not change, but as the supplier of an essential service, for many of the market participants.



a. Barbados Marketing Corporation (BMC)

One of the responsibilities of the BMC is the provision of a slaughtering facility to the livestock sector through its abattoir at Harbour Road. This is the primary slaughtering facility in the island and is responsible for the slaughtering of pigs, cattle, calves, sheep and goats at subsidized fees. The plant was built in 1961 and includes a lairage facility, killing room, two chilling rooms, an inedible by-product rendering plant and a boiler house. The rendering plant and the boiler house have not been in operation for some years.

Animals are delivered one day in advance of slaughtering and the carcasses are returned to their owners to be sold after health inspection and 24 hours in chill storage. The BMC does not buy or sell on their own account. Animals are slaughtered strictly on a "fee for service" basis. (Table II-30).



There is the unanimous opinion within the livestock sector that the present abattoir facility is inadequate and should be replaced by a more efficient and modern abattoir and processing plant. Reasons for this are:

- The present location is unfavourable and does not allow for any kind of substantial improvement.
- Sanitation is generally maintained but not with the most effective means.
- Holding pens for animals are limited.
- There is at present a fishing harbour development project being undertaken by the government in the centre of Bridgetown, for the land occupied by the slaughter facilities.

The abattoir is at present underutilized (Table II-31). With a capacity of 4000 pigs and 1000 cows per month it slaughters approximately 700 pigs and 100 cows each month. Excessive clandestine/backyard slaughtering occurs each month primarily due to the relatively

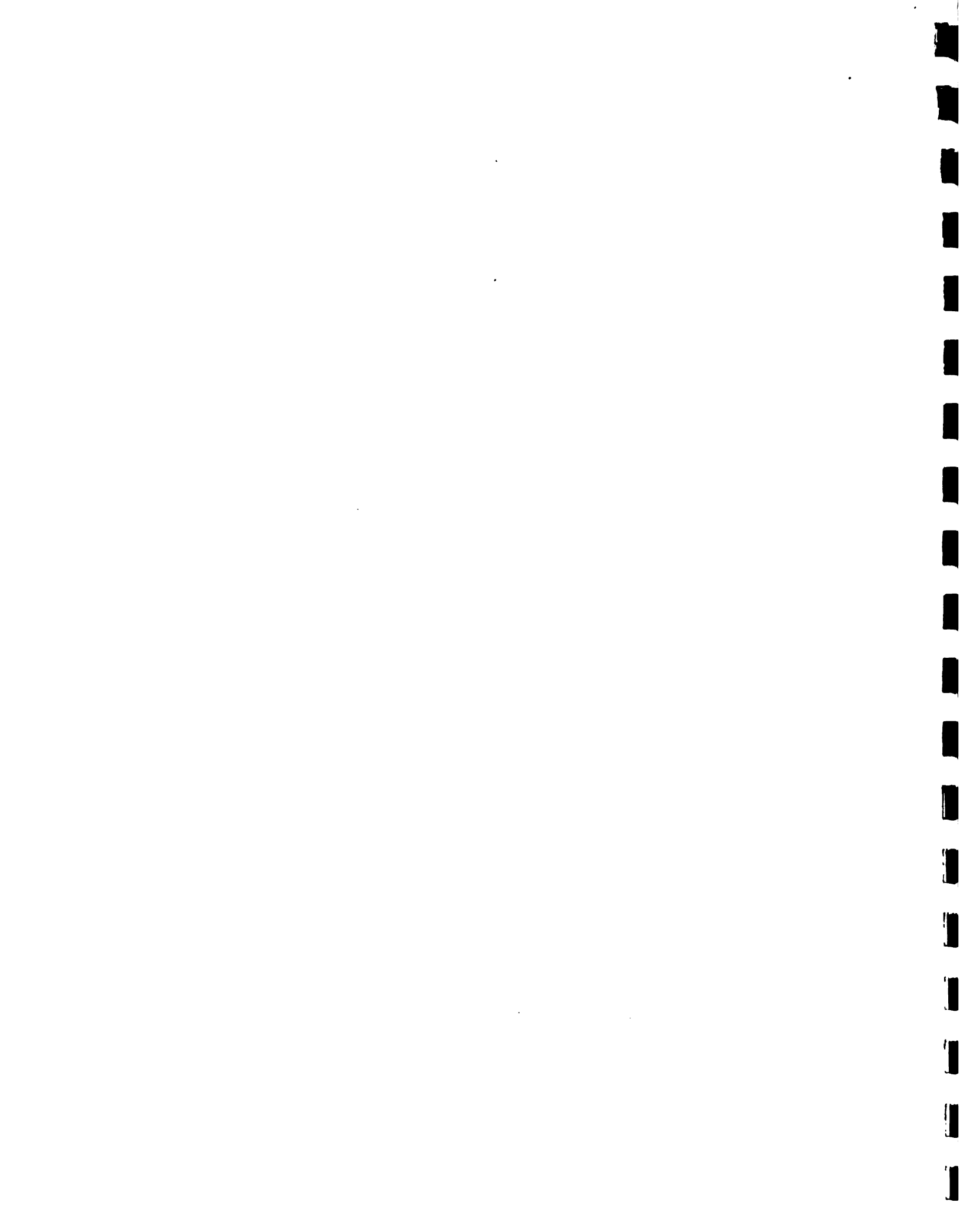


far distance the producers have to travel to have their animals slaughtered at the abattoir. Transportation fees are generally high. This . widespread backyard slaughtering will definitely have a negative impact on any attempt to develop a more efficient marketing system, if it is allowed to continue, as it will divert supplies from the abattoir resulting in more expensive operations because of reduced throughput.(Table II-32)

Farmers deliver about 40% of the animals slaughtered by the BMC, speculators and butchers 50%.

b. Direct Farmer Marketing

The marketing channel diagram (fig. II-4) indicates alternative markets outlets for farmers. In fact there are alternatives but each producer may feel some constraints due to his/her particular problems. He/she has the option to take the livestock to the BMC for slaughter and then deliver directly to the public retail



market, or to the processors or to individual butcher shops or to the supermarkets. Constraints to the direct marketing outlets include the need for orders or previous commitments with buyers. He/she must have transportation for both livestock and meat. Farmers should be aware of prices at the wholesale level in order to negotiate a fair price and must bear full responsibility of meeting his orders and commitments. Producers with one or two animals for sale are not likely to market directly in this fashion. Producers who deliver their pigs to the BMC for slaughter sell mostly to processors.

The alternative of selling at the farm to speculators and butchers is the main outlet for small farmers. The farmer who is not aware of prices and values is without bargaining power in dealing with itinerant country buyers. For this reason they complain that the market is not adequate. It is not that prospective buyers are not available but that the

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prices offered are not up to fair market value. It would appear that a farmer could just wait for or call another butcher if the first price offer is not acceptable, but there is sufficient communication among butchers and speculators that prices offered do not vary significantly. Herein lies a major weakness in the present market system.

c. Speculators and Butchers

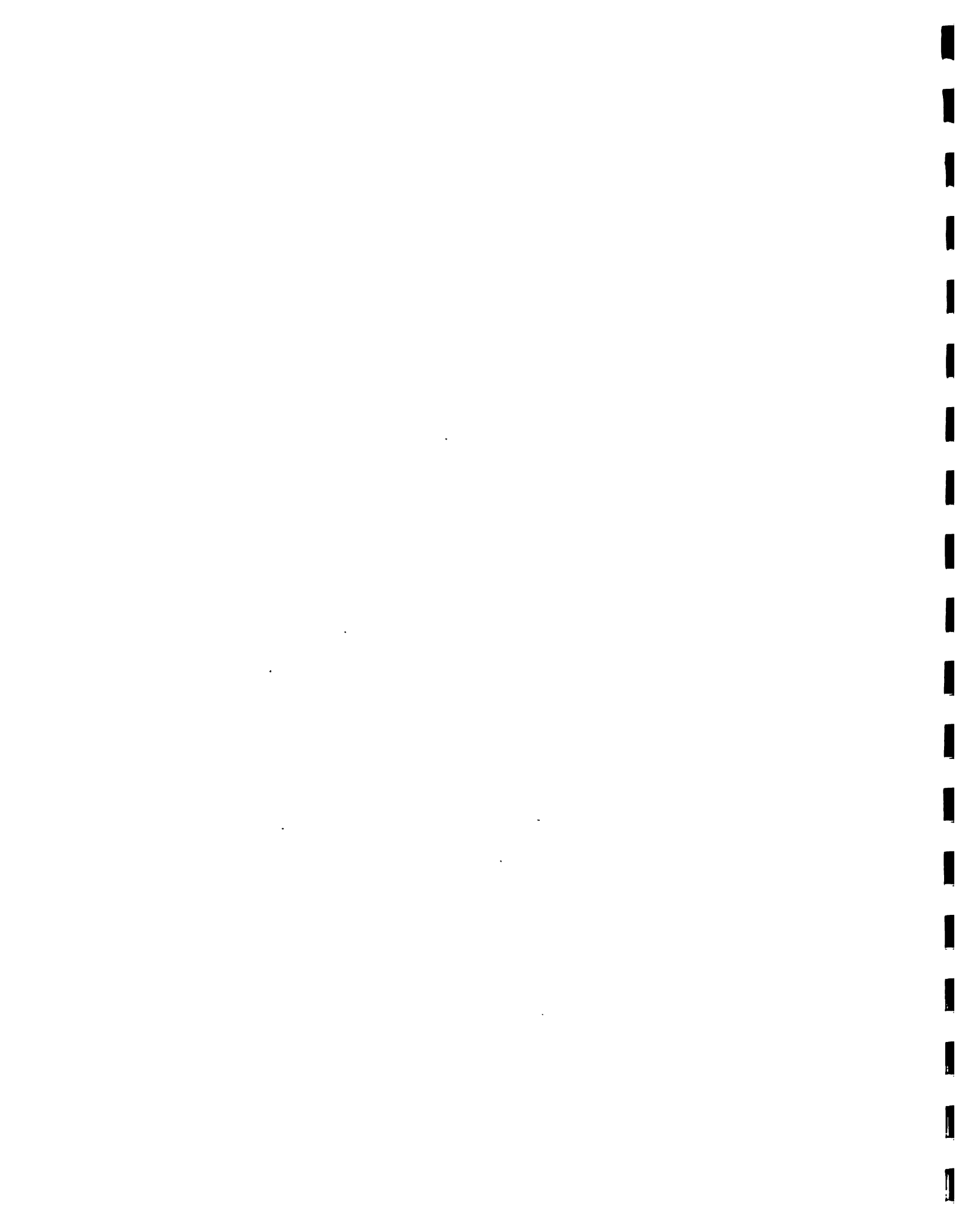
Both the speculator and the butcher perform basically the same functions (assembly, pricing and transportation) in the marketing channel but the difference is that the butchers are cutting and retailing the meat. The speculator is prepared to sell the live animal or the dressed carcass as the demand dictates. He stops short of cutting and retailing.

Vertical integration of production on the farm, assembly, trucking, slaughter (in some cases), cutting and retailing can be found among many of the butchers at the



public retail markets. The people integrating all these functions might be called farmers with forward integration to retailing or butchers backwardly integrated to production. Some marketing efficiencies should result from the reduced number of ownership changes and the coordination of farm marketing to retail demand. However, producers are not the recipients of the benefits.

Speculators and butchers do not vary prices in accordance with the supplies offered for sale or the demand for their sales. They do vary prices in accordance with their bargaining position with individual sellers. Some price differences are related to flesh cover of beef and sheep but back fat is the most important quality in pig prices. Farmers claim that speculators and butchers take up to 100% mark up for their services.



d. Wholesalers

There are two types of wholesalers in the market for meat. One type is specialized in wholesaling the products of the processors. They fill orders for and deliver to the supermarkets, mini-markets, restaurants and hotels. They do not deal with fresh meat.

The second type are the wholesale importers of meat cut, wrapped and frozen to meet the orders of hotels, restaurants, supermarkets and minimarkets. These intermediaries are identified as importers who integrate with the wholesale function. In fact a number of supermarket chains have their own importer offices and thereby integrate the importing, wholesaling and retailing functions. Although most imports come ready for the retail display case, some retailers do recutting for their specific trade. For example, beef clod is often cut into smaller roasts or even into steak for their customers. No deboning of imported meats is done at this time. It is



not necessary with the present form of imports.

Synchronising imports of meat to the internal demand is a major function of the wholesalers. There are several specialized wholesalers and some retail supermarkets who have their own wholesale department. By nature of the wholesaling function, large volumes are handled by each. Normally the wholesale importer takes orders from clients well in advance (sometimes they must bid for orders), arrange with foreign exporters for the supplies, arrange for transportation and financing as well as delivery arrangements. They must apply annually for import permits.

e. Supermarkets

Supermarkets in Barbados have become established as the dominant food distribution institution. There are 28 major supermarkets in Barbados and most of these are affiliated with three major chain companies. Retailing of meat at these



markets is rather sophisticated with large display cases, great variety of cuts and qualities wrapped and priced for the convenience of consumers. Their meats are mostly imported by specific order and are frozen and ready for branding and pricing. Only two supermarkets were identified that sell local, fresh, unfrozen beef and mutton, but all sell pork that has been cut, wrapped and frozen by themselves.

Only the two markets selling fresh unfrozen meat claim a consumer preference for meat in that form. It is not surprising that others made no similar claim. Although butchers at the two public retail markets reported that their customers prefer fresh unfrozen meat. No clear impression can be gained about consumer preference for fresh versus frozen meat. The relevant issues relate more to quality and pricing relationships.

The supermarket in Barbados is by far the major retail outlet for meat and it is safe to predict a continuance of this



market dominance as new stores open and volumes of sale increases. The number of stores and divergent ownership suggests a healthy competitive environment among them even though each has its own special locational advantage.

f. Public Retail Meat Markets

The two public markets play an important role in meat marketing for particular customers. There are no data available to verify the observation that medium and low income consumers mostly frequent these markets. The merchandizing system is not sophisticated, there are no coolers, a limited number of power meat saws, no wrapping for display, in fact no display facilities other than the counter where sales occur. Sanitation facilities are limited and the customer has to evaluate the meat and service without guidance. All prices are fixed by mutual agreement and there are no variations related to quality or cuts or types of meat. What does not sell one day is held



over in coolers which are located only at the Fairchild Street market. These markets are the major outlet for fresh unfrozen locally produced beef and mutton, and an important though not the major outlet for fresh pork.

The differences in merchandizing meat at these markets in contrast with the supermarkets are noteworthy. Perhaps both systems are essential but each has its weaknesses. The supermarket at present are not equipped to serve the local fresh meat trade but the public markets are not prepared nor equipped to provide the quality and services required by a major part of the consumers.

There are minimarkets and a few corner groceries and butcher shops. Their part in the total retail market for meat is considered to be minor.

g. Hotels and Restaurants

The hotel and restaurant outlet for meat has partly been discussed previously

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in conjunction with the tourist demand. The main points to emphasize are that while food procurement managers claim no preferences for fresh meat over frozen, they do not have facilities, nor the inclination to deal in the local fresh meat trade. Their needs for high quality, pre-cut and frozen meat are best satisfied by imports. Some prepare long term plans and place specific orders well in advance.

h. Meat Processors

Three privately owned meat processing plants currently operate in Barbados. The Barbados Packers and Cannery Limited (BARPAC), located in Edghill, St. Thomas, commenced operations in 1976 and is the only plant that does its own slaughtering. The plant consists of a pig slaughter unit, chill rooms, freezer and a processing room. An average of 50 pig carcasses are processed each week. The main products are hams, luncheon meat, frankfurters and bacon.



The other two plants, Hanschell Inniss Limited and Hojeg Meat Processing Limited, started operations a few years ago and are equipped to meet the highest hygiene and technical standards. Each plant processes about 40 carcasses weekly and the meat products include cooked ham, pickled ham, frankfurters, and dry sausages.

None of the processors utilize local beef, a result of unstable supply, inferior quality and high prices for beef.

An average of 470,000 lbs of imported beef are processed by the three major processors. Substantially more pork is processed. Hanschell Inniss alone processes 700,000 lbs of imported pigmeat and 300,000 lbs of local pigmeat each year. Yet each processor has reported their plant as underutilized. They are presently producing for the local market only and would like to expand to regional markets but are impeded by two major obstacles:



- The inadequate meat handling and slaughtering techniques employed at the BMC's abattoir.

- Trinidad, the major regional market is no longer importing processed products from Barbados.

One processor is hoping to go into the processing of corned beef. This calls for greater utilization of beef but unless a low-cost supply of local beef is available in sufficient quantity, imported beef would be used for processing.

2.5.4.4. Wholesale and Retail Price Mark-ups

The wholesale mark-up for meat in Barbados average about 41% (Differences between the C.I.F. import prices and the wholesale price divided by the C.I.F. price). Table II-33 compares prices reported by the wholesalers and retailers for the main types of beef and mutton. The range in prices reported were wide. Averages are presented in the table. The wholesale mark-up was highest for the Irish



Intervention beef stew (58%) and lowest for New Zealand beef stew (27%).

Retail mark-ups (the difference between wholesale and retail prices divided by the wholesale price) show even a greater variation by type of meat. The average retail mark-up was reported to be 20% for the Irish Intervention beef stew, 45% for beef clod but an extreme of 98% for mutton shoulder. This high mark-up was reported by 4 different retailers. The simple average mark-up was reported at 46.6% for all meats compared, but this would drop to 33.3% if the extreme high for mutton shoulder were dropped from the average.

Another way to measure price changes is by using margins which are preferred by merchandizers because they appear to be less (margins are calculated by dividing the price difference by the selling price instead of the buying price). Table II-33 shows the comparison between mark-ups and margins.

No matter how the prices are compared the wholesalers' charges for their services are abnormally high. They must pay import taxes,



cost of freezers and distribution as well as their normal buying and selling costs. But their charges do not include the cost of slaughter which often are included as part of the wholesale mark-ups.

Retailers charges for their services are high compared with studies in other countries. The fact is that while some supermarkets are doing very little cutting and wrapping of imported meats, their mark-up surprisingly exceeds charges by supermarkets that cut and wrap practically all their meats.

Butchers selling at the public retail markets reported that they pay \$4.40 per kg for beef, mutton and pork carcasses sold by farmers or speculators after slaughter. The butchers then retail all meats at \$7.70 per kg, giving them a 75% mark-up (43% margin).

Butchers reported that they preferred to buy live animals directly from producers in the country because they made more money on these purchases. A supermarket reported a 33% mark-up for beef and lamb purchased from farmers after slaughter.

for mutton and pork as well as cattle wholesale.

2.6 THE MARKETING OF DOMESTIC SUPPLIES OF FRESH MILK

The analysis of the supply of locally produced fresh milk is complicated by two unknowns, viz:

- The number of small farmers who produce milk for home and neighbourhood sale, and
- the amount of milk of produced and sold.

An official study made some years ago estimated this amount to be between 3 and 4 million litres, but current expert opinion has rejected this as being excessively high.

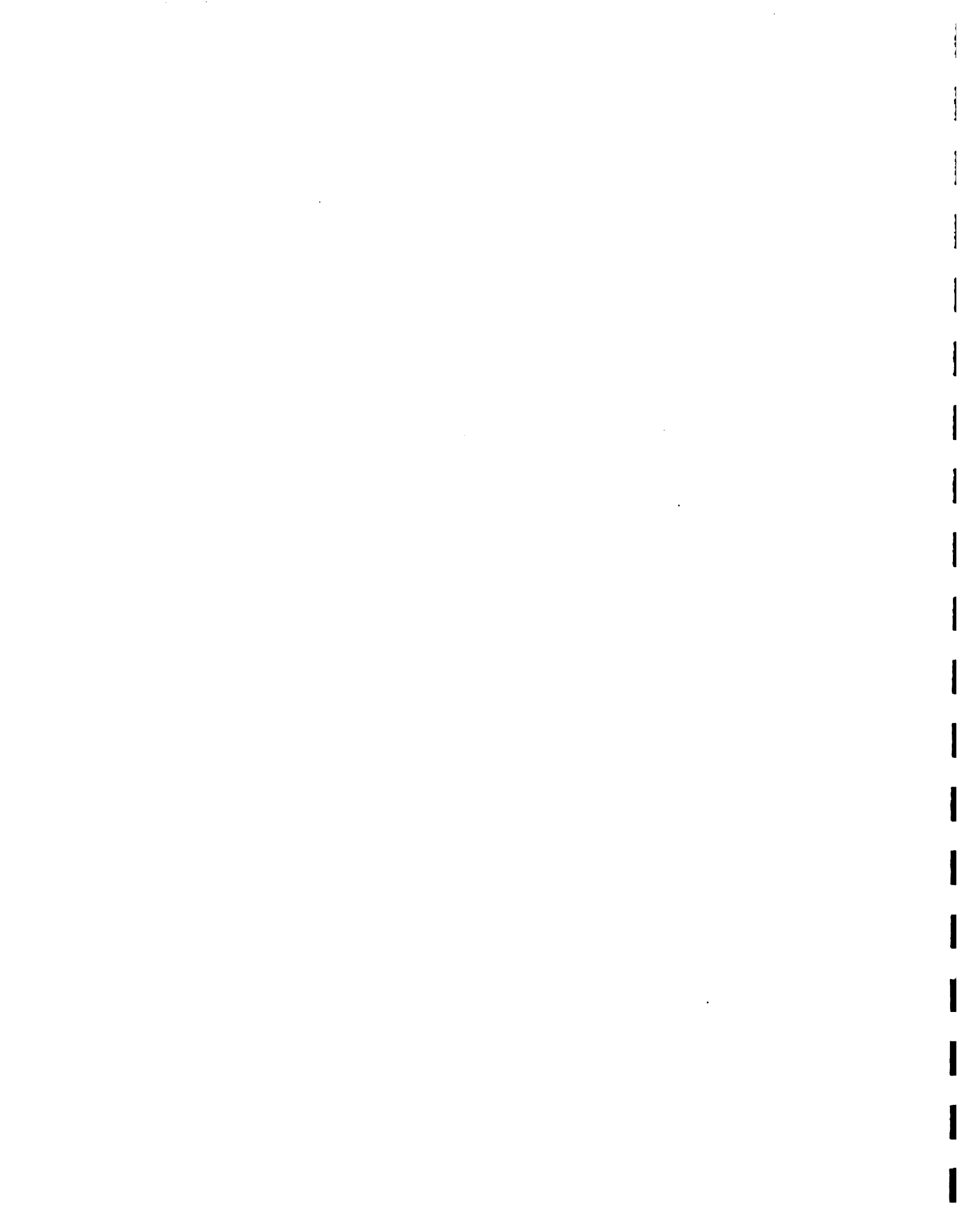
The analysis is also complicated by distortions which arise from the manufacturing/processing operations of the Pine Hill Dairy. This monopoly has erected the figure of 3.0 million litres as the maximum of fresh milk that they can accept for processing into pasteurised milk. The



company further claims that any production over this amount is a "surplus" which must be diverted into the manufacture of evaporated milk at a substantial loss of over BDS\$1.00 on every 14.5oz can made. This 'loss' appears when the comparison is made with their customary manufacture of evaporated milk from imported milk powder.

There are between 31 and 34 commercial dairy farms ranging in size from 10-15 animals to over 100 milking cows who are currently supplying the Pine Hill Dairy with well over 30 million litres per year. Fresh pasteurised milk is retailed at a controlled price of \$2.45 per litre regardless of fat content at supermarkets and neighbourhood shops all around the island.

The Barbados consumer has traditionally been attuned to the use of evaporated and powdered milk and it is only within recent years that the use of fresh pasteurised milk has become popular. Even so, the per capita consumption of fresh milk lags behind that of metropolitan societies, in spite of the fact that Barbadians enjoy one of the highest per capita incomes among countries in the hemisphere and that the elasticity of the demand for milk has been estimated at around 0.9. Nevertheless, the milk processors' own records indicate that the situation is changing fairly rapidly at present and demand appears to be increasing at an increasing rate.



In 1985 a committee was appointed within the Ministry of Agriculture to examine the "problem" the processing company has outlined (see Annex II-1) and the last paragraph of their report deserves to be quoted in full here:

"Experience suggests that it is unlikely that the Dairy Farmers and the Pine Hill Dairy will ever agree on the approach to the "surplus Fresh Milk' problem. The Ministry of Agriculture and Natural Resources will therefore have to determine the most appropriate approach to the problem".

2.7 INSTITUTIONAL FRAMEWORK

Responsibilities for the development and management of agriculture in Barbados are shared by all sectors public, parastatal and private.

Agricultural related activities are carried out by the Ministries of Agriculture and Natural Resources, and of Finance and Planning. The Ministry of Agriculture and Natural Resources deals with the non-sugar sub-sectors, and the Ministry of Finance and Planning with the financial aspects of the sugar sub-sector.



2.7.1. Ministry of Agriculture and Natural Resources (MANR)

The Ministry of Agriculture and Natural Resources (MANR) has responsibility for both its statutory port folio and for parastatal operations.

Within the realm of its centralised activities, the Minister carries out his functions through offices of the Permanent Secretary, the Permanent Secretary for Special Assignments and the Chief Agricultural Officer. (See figure II-5)

The Permanent Secretary directly guides, supervises, follows up, controls and evaluates the organization and functioning of the parastatal sub-sector, as well as the administrative, regulatory and other "staff" activities in the ministry: Through its Chief Agricultural Officer, he carries out similar functions with respect of the remaining professional services, under the two Deputy Chief Agricultural Officers.

The Permanent Secretary for Special Assignments is assigned projects which require a certain seniority in authority to effectively coordinate and



integrate the diverse activities under different units within and outside of the Ministry. These projects are mostly concerned with construction and infrastructural development.

The Chief Agricultural Officer has under his command the main professional activities and services that the Ministry directly provides to the agricultural community of the country. The Deputy Chief Agricultural Officer for Research deals mainly with agricultural services and the Deputy Chief Agricultural Officer for Extension and Development mainly deals with crop and livestock production.

The latter division includes some research and technical assistance type of activities, both in production and animal health.

Within the Administration Unit and directly under the Permanent Secretary, the Ministry manages a revolving credit for the benefit of farmers involved in the expansion of dairy, beef and/or mutton enterprises.

In addition, the Minister of Agriculture also resorts to a series of Committees and Boards that



bring together its technicians and representatives of the Ministry's clientele for the making and implementation of key decisions and specific commodities and production issues.

2.7.2 Parastatal Organizations

The Barbados Agriculture Development Corporation (BADC), the Barbados Marketing Corporation (BMC) and the Credit Division of the Barbados National Bank are the main parastatal institutions serving the sector.

2.7.2.1. The Barbados Agricultural Development Corporation (BADC)

The Barbados Agricultural Development Corporation is in charge of running a series of government plantations and an investment project. The main purpose of its activities to make these plantations profitable and to use them as a showcase for the development of the private sector. Within its sphere of influence, BADC carries out some research and extension activities.



2.7.2.2. The Barbados Marketing Corporation (BMC)

The Barbados Marketing Corporation (BMC) concentrates mainly on the marketing aspects of the sector. It carries out regulatory functions including the issuing of export and import permits. In addition to export permits it is concerned with not depleting produce supplies for the local markets. In relation to imports BMC monitors the quality of Barbados products going abroad. Concerning both of these functions, BMC concerns itself also with market research and analysis to keep producers and public at large duly informed.

The BMC owns the major industrial slaughter-house on the island. Currently it services livestock producers, intermediaries, meat processors and supermarkets, for a fee.

2.7.2.3 Barbados National Bank (BNB)

To service the agricultural sector, there is a credit division at the Barbados National Bank. In the past, this service used to be rendered by the Agricultural Credit Bank within



the structure of the Ministry of Agriculture and Natural Resources (MANR). Presently this unit of MANR is restricted to the collecting of past debts.

2.7.3 Private Sector

The Barbados Agricultural Society (BAS) and the Pine Hill Dairy are two of the main private institutions which together with the Ministry and its parastatal guide and implement agricultural and livestock development in Barbados. Both of these organizations have to be specially taken into account in any efforts to develop agriculture and livestock production in Barbados.

The Pine Hill Dairy is the only milk processing plant in the island. It is owned by Barbados Dairy Industries Limited. Share distribution is as follows:

Government of Barbados	40%
New Zealand Dairy Board	20%
Northern Foods Limited, U.K.	20%
Farmer and Other Private individuals	40%

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The composition of the private ownership and their trading relationships with Barbados are of considerable significance if one contemplates any variation in the operation of the Pine Hill Dairy.

Within this sector, importers of agricultural and livestock produce are an important and decisive segment of Barbadian society, which has to be specially taken into account and probably brought into the picture of whatever scheme is to be designed for the development of local produce in general and of livestock in particular, especially if it leads to increase of produce and replace imports of similar goods.

2.8 CREDIT AVAILABILITY

The institutional farm credit structure in Barbados consists of eight (8) Commercial Banks including the Government owned Barbados National Bank (B.N.B); the Ministry of Agriculture and Natural Resources (M.A.N.R.); and some farmers' organizations under the umbrella body of the Barbados Agricultural Society (B.A.S.).

Between 1975 and 1984, total farm credit increased from BDS\$11.5 million to BDS\$37.3 million, while livestock



credit increased from BDS\$3.0 million to BDS\$7.0 million in the same period. Out of the BDS\$37 million disbursed for agriculture in 1984 the livestock sector received some 20%.

From 1975 to 1980, the sugar cane sector received on average 2.4 times the amounts of credit to the livestock sector. This average increased to 3.5 from 1981 to 1984. Food crops have received a fairly constant amount of credit in the five years under study.

2.8.1. Barbados National Bank (BNB)

In April 1978, three (3) Government owned Local Banks - the Sugar Industry Agricultural Bank (SIAB), the Agricultural Credit Bank (ACB) and the agricultural window of the Barbados National Bank (BNB) were merged to form the Agricultural Division of the Barbados National Bank.

At present, two lines of credit are available to the bank. One comes from the Caribbean Development Bank (CDB), (inherited from the Barbados Development Bank) and the other from the banks' own sources - discounting with the Central Bank of Barbados (CBB), and through grants from the Central Government.

The portfolio of the bank is currently geared mainly towards plantations and it is the agency through which funds from the Spring Hall Land Lease Project and the Integrated Rural Development Project are disbursed. The bank is geared for project lending of 5,7 or 10 years, but owing to severe credit marketing problems, the request for these types of loans have been very small.

Loan Conditions

- a. Applicants must own their land or have relatively secure tenure.
- b. Credit worthiness should be established.
- c. For cattle or sheep projects, applicants should be sited near public grazing lands if they do not have their own.
- d. Generally anything from operating funds to purchase of machinery is funded. However, it is only in some cases that the purchase of lands and buildings to start up a farm will be financed.

- e. Loans are provided at a concessionary interest rate of 8% (the general rate being approximately 13%).

Before loans are granted, bank inspectors visit project sites to ensure that all loan pre-conditions are met and to discuss the project with the farmer. To safeguard the Bank's interest, there is phased disbursement of funds and/or suppliers may be paid directly by the bank.

Generally speaking, it has been found that the small farmer has been more diligent in his repayments than the large-scale farmers.

2.8.2. The Barbados Agricultural Society (BAS)

The Barbados Agricultural Society (BAS) has a credit scheme to assist farmers in management, marketing, purchase of inputs, record-keeping, data collection and other requirements.

Conditions of Loans

- a. A maximum of BDS\$12,000 of which no more than 75% of the total cost of capital improvements and equipment to be financed can be lent to an individual. Operating funds may be financed up to 100% of requirements.

- b. A maximum total limit up to BDS\$25,000 can be lent to any one commodity association.
- c. Individuals may be eligible for unsecured loans up to a maximum of BDS\$1000 per borrower at any one time.
- d. Borrowers must be full financial members of the BAS for a minimum of 12 consecutive months preceding the date of application.

This credit scheme was made possible by a grant from the Cooperative Development Fund of Canada.

2.8.3 The Livestock Revolving Credit (M.A.N.R.)

The Livestock Revolving Credit Fund was established by the Ministry of Agriculture and Natural Resources (M.A.N.R.) to provide a credit facility specifically for the expansion of the beef and mutton industry, but also for livestock generally.

This Livestock Development Fund of BDS\$1 million is to augment the resources of the existing Dairy Development Revolving Fund which was exclusively for the dairy industry.



The specific purpose of the Fund is to provide financing for:-

- The purchase of approved livestock,
- Construction of livestock buildings,
- Fencing and pastures,
- Installation of watering systems for livestock,
- Purchase of machinery and equipment for the livestock industry,
- Establishment of feed storage facilities, and
- Any other purpose connected with livestock production as may be approved by the Minister.

Conditions of Loans

- a. Loans will be made available for a maximum of ten years.
- b. Adequate security shall be required for all loans.
- c. The interest rate shall be 3% per annum.
- d. All applicants qualifying for a loan shall be entitled to a three (3) year moratorium if requested.



- e. The borrower will be required to enter into an agreement with the lender in respect of repayment of the loan.
- f. The maximum amount of a loan to an applicant shall be \$250,000.

All livestock producers and potential livestock producers are eligible to apply for loans from the Fund. A Loans Committee processes all applications and makes recommendations to the Minister with whom the final decision rests.

Resources for the Dairy Development Fund are a grant from the Canadian International Development Agency. The additional funds for the Livestock Development Fund have been sought from the European Development Fund (E.D.F.).

2.9 POLICIES AS THEY AFFECT THE LIVESTOCK SECTOR

2.9.1. The Development Strategy

Three main concerns are at the heart of the 1983-1988 Agricultural Development Plan of Barbados, the downturn of the international sugar market, with all the resulting internal consequences, the escalating food import bill (see table II-9) and the declining employment levels in agriculture in



particular and in the economy as a whole. With this frame of mind the 1983-1988 Agricultural Sector Plan defines the following overall objectives.

- (i) To optimize the agricultural trade balance by increasing agricultural export earnings and reducing agricultural (food) imports to the extent that these are technically, economically and socially acceptable;
- (ii) To improve farm incomes as means of raising the standard of living of the agricultural community and to enhance the nutritional status of the community at large;
- (iii) To stabilize the agricultural employment trend and as far as possible make the sector an effective contributor to employment generation;
- (iv) To improve the level of efficiency in the sector especially at the administrative (institutional) and farm levels;
- (v) To conserve land and water resources and create the conditions for their efficient utilization; and



- (vi) To achieve more balanced growth in the agricultural sector by intensifying the diversification effort and by strengthening the capacity of the Ministry of Agriculture to realize more effective control over both sugar and non-sugar agriculture.

The main strategy selected is that of diversification from sugar cane, while improving the current yields of the crop. An important role within this strategy is assigned to the promotion and support of mutton and beef production in order to substitute, at least partially, the imports of these. Attention will be paid to the small farmers, while preventing the unnecessary fragmentation of land. In fact the Government has embarked on a Rural Development Project, with financial support of the Inter-American Development Bank, which aims at developing plantation tenancies and small farmers as viable entities. It has also implemented the Land-lease Project (also with financial support from the IADB) which aims at leasing land to full-time farmers.

As mentioned before, import substitution is a pivotal area in the strategy selected by the GOB, and several elements are pointed out in the 'Plan', including among others:- pricing policy, import fees, import controls, reorganization of non-sugar marketing and the development of Agro-Industries .



The Government has recently imposed a 30% import levy on all beef brought into the island, the effect of which has not yet been felt internally, but which will to stimulate help the development of the local meat industry.

A special line of credit has been established in the Ministry of Agriculture, as part of the Dairy Revolving Loan Scheme already in existence for several years (see Annex II).

The 1983-88 Agricultural Development Plan has defined, more specifically, the following objectives for the dairy, beef and mutton subsectors:-

2.9.1.1. Objectives for the Dairy Sub-sector

- a. to increase and maintain productivity among herds by improving the efficiency of management;
- b. to reduce the industry's dependence on imported feeding materials by significantly increasing the quality of pastures and by making greater use of other locally available feeding materials;



- c. to encourage greater consumption of fresh milk (especially in the pasteurized form) by the domestic population;
- d. to integrate the small farm sub-sector into the mainstream of dairy development.

2.9.1.2. Objectives for the Beef Sub-sector

- a. to encourage further expansion in beef production;
- b. to increase the level of self-sufficiency by encouraging a shift in consumption to other locally produced meats;
- c. to improve the organization in beef marketing as well as the entire beef industry.

2.9.1.3. Objectives for the Mutton Sub-Sector

- a. to increase mutton production by 100% over the plan period;
- b. to increase exports of Blackbelly sheep breeding stock;



- c. to improve production efficiency through organization and modernisation within the industry;
- d. to improve the delivery of extension services to sheep farmers;
- e. to further improve the characteristics of the Blackbelly breed through research.

2.9.2. The Rural Development Strategy

Although there is no formal document which specifies the rural development strategy in Barbados it is quite clear that the development of small farmer agriculture in the rural areas is one of the main corner-stones of the development policy. Indeed any official document stating the national development objectives of the island puts the emphasis on items such as:-

- improving farm income as means of raising the standard of living of the agricultural community;
- enhancing the nutritional status of the community at large;
- stabilizing the agricultural employment trend, etc.



The sector plan for agriculture in addressing this problem has suggested various ways and measures to cope with it and improve the conditions of "more than 10,000 small holdings".

In accordance with the stated strategy for the first point above, Government has taken action to implement its policy by allocating the largest portion of its development budget to small farmer projects. An analysis of the proposed Capital Expenditure Programme for 1983-1988 reveals that 75% of the total approved budget for the five year period, is devoted to three small holder's projects i.e. Scotland District (Soil Conservation and Black River); Rural Development Project and the Springhall Land lease Project.

Additional measures proposed in the five year plan to implement the Rural Development Strategy are:-

- Establishment a strong agricultural information unit;
- promotion of cooperative farming;
- initiation of youth farms;
- training of small farmers in both production and management techniques;



In devising its strategy regarding the problem of employment in the agricultural sector, the Government has taken, according to the plan, the following factors in consideration:-

- the increasing average age of the agricultural labour force;
- the reluctance of the young to enter the sector;
- the presence of a labour shortage in the sector inspite of the existence of high unemployment;
- the fact that wage levels have placed the sector at a disadvantage in the labour market;
- the need to maintain a proper balance between the pace of merchandizing in the sector and the level of unemployment.

2.10. SERVICES AVAILABLE TO THE LIVESTOCK SUBSECTOR

Research and extension - related educational and support services are provided to livestock farmers by several organizations. They include both government and private sector institutions and farmers' organizations. Extension services are



available to the livestock subsector from the Caribbean Agricultural Research and Development Institute (CARDI), the Barbados Agricultural Development Corporation (BADC), the Barbados Agricultural Society (BAS), and the Ministry of Agriculture and Natural Resources (MANR).

2.10.1 The Ministry of Agriculture and Natural Resources

Within the Ministry of Agriculture and Natural Resources, research and extension related services available to the livestock subsector are located within the Extension and Development Department and in the Agricultural Information Unit.

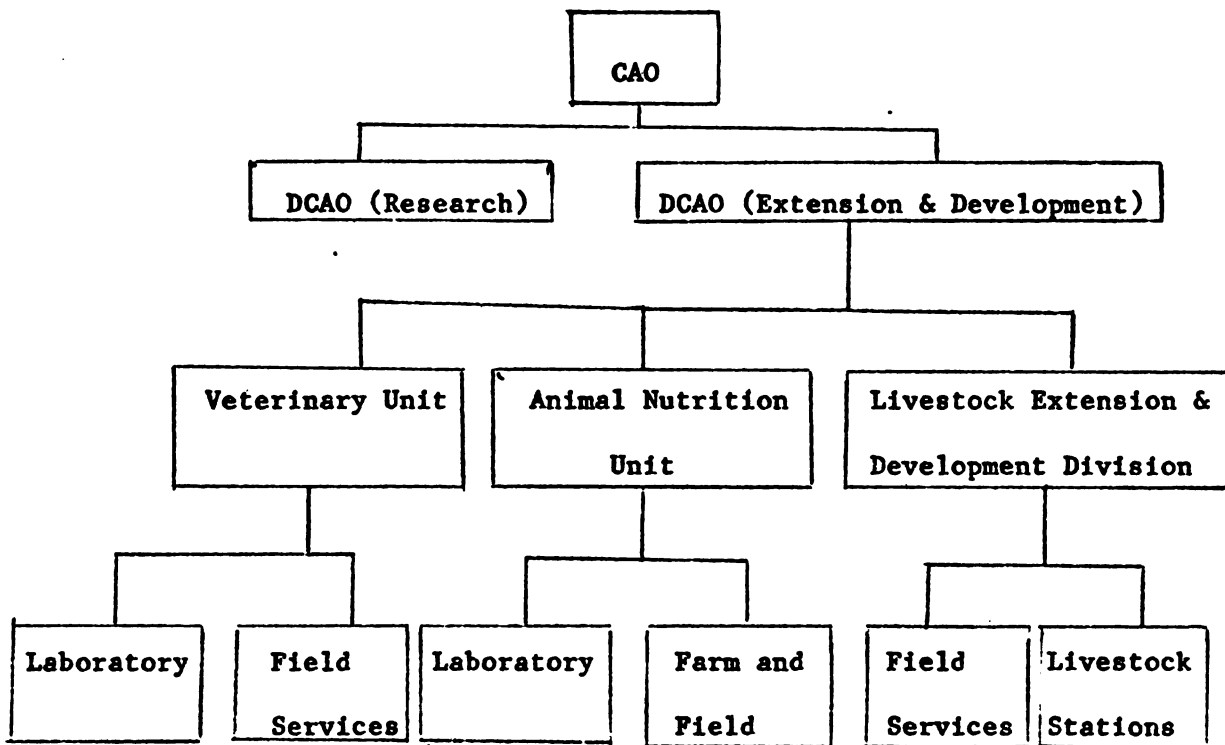
The Extension and Development Department is headed by the Deputy Chief Agricultural Officer, Extension and Development (DCAO/ED) and consists of the Veterinary Unit, the Animal Nutrition Unit and the Livestock Extension and Development Division (see Fig. II-6).



Figure II-6

BARBADOS INTEGRATED LIVESTOCK PROJECT

Organisational Structure of the Extension and
Development Department, MANR, Barbados

2.10.1.1. Veterinary Services

The Veterinary Unit consists of two autonomous sub-units, (i) a field services and (ii) a vet. laboratory.



Government provides free of charge:

- Cost of Epidemiological Disease Surveys.
- National Animal Health Support Programmes.
- Extension and Advisory Services.
- Laboratory Diagnostic Services.
- Meat Inspection Services.

a. Animal Health Field Services

Is staffed by two professionals, the Senior Veterinary Officer and a Veterinary Officer, and six Animal Health Assistants trained at REPAHA in Guyana. Their responsibilities include the enforcement of regulations on importation of animals (Diseases and Importation Set, Import Control Regs.) The department is also responsible for providing ambulatory service to MANR's animals and is the advisory body to the Government of Barbados on Animal Health matters.

It should be pointed out that the Veterinary Services do not have legal authority to carry out meat inspection; this vested in the Public Health Department of the Ministry of Health.

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b. Veterinary Diagnostic Laboratory

The Veterinary Pathologist is the head of the laboratory. He is supported by five (5) well qualified laboratory technologists. As the need arises, the Animal Health Assistants support this staff by performing the simpler laboratory procedures.

The Veterinary Diagnostic Laboratory (V.D.L.) was established in 1970 by the Comfith Project and the Canadian International Development Agency (CIDA). The Laboratory was handed over to the Barbados Government in 1972. Fees for pets and horses were instituted in 1984. Specimens from farm animals are still free of charge.

The laboratory provides testing in the following disciplines: Parasitology, Serology, Hematology, Microbiology, Clinical Chemistry, and Histopathology

2.10.1.2. Animal Nutrition Unit (ANU)

The Animal Nutrition Unit (ANU) was established to do research on feeds and feeding systems for both ruminants and non-ruminants and on forages and forage



production systems, and to offer specialized extension to livestock farmers.

Three (3) main activities are carried out on the station:

a. Forage Production:

Since its inception 61 grasses and 22 legume species were screened on the station in addition to more than 150 sugar-cane varieties selected for livestock feed. Agronomic evaluation was carried out on all the forages and nutritive evaluation on most. From this work the Animal Nutrition Unit has been able to recommend seven grasses and four legumes to be used in forage production systems. To assist farmers with pasture development, the ANU supplies planting material and where necessary assists with land cultivation and planting of the forages.

As a service to farmers the Ministry of Agriculture cuts grass and bales hay. A silage programme was recently started in which silage is made on farms as a free service as a means of teaching farmers the techniques of silage making.



b. Feeding Trials:

A barn capable of housing 36 steers and approximately 300 sheep is used for feeding trials which are carried out at the ANU.

c. Analytical Laboratory:

An analytical laboratory equipped to carry out chemical analyses operates at the station to offer support to the agronomic and nutrition studies being done. The laboratory also offers a limited feed testing service to farmers who submit samples through extension agents.

The ANU laboratory is staffed by a graduate assistant (a science graduate), and an untrained assistant. The field services section is headed by an agricultural graduate with responsibility for the day-to-day management of the ANU's pastures and animals as well as for the organization and management of the hay and silage making services for farmers referred to above. Working closely with this officer on the hay and silage programme is a full-time dairy extension consultant attached to the Agricultural Diversification Project. The head of ANU is a graduate agronomist and animal nutritionist.

2.10.1.3 Livestock Extension and Development Division

The Livestock Unit is headed by a Senior Agricultural Officer (Livestock Specialist) who is responsible for managing and coordinating all the non-veterinarian and non-ANU extension and other services provided to livestock farmers by the MANR. These consist of (1) the Artificial Insemination (AI) service; (2) the Agricultural Field Stations; Central Livestock Station (CLS), Greenland, Sedgepond, Home Agricultural Station and (3) Specialised Extension Services for dairy, sheep and pigs.

2.10.1.4 Artificial Insemination Service

The A.I. Service operates out of the Central Livestock Farm, and serves only the dairy industry. It is under the management of a Senior Agricultural Assistant who also has responsibility for dairy extension work.

According to the 1984 Annual report of the Livestock Extension and Development Division farmers may elect to have their cows inseminated either with fresh semen (Holstein, Guernsey or Jersey) or with imported frozen semen (Holstein, Jamaica Hope, or Jersey). In 1984 the

AI Unit received 4,016 requests for inseminators and responded to 3923 of these. Fifty-seven per cent of all inseminations were with frozen semen, and the Holstein was the most common breed used. Three full-time AI officers and one laboratory technician staff the unit.

2.10.1.5. Agricultural Field Stations

Four agricultural stations provide extension - related services to livestock farmers. These are the Central Livestock Station (CLS) located at the Pine, just outside of Bridgetown, Greenland Agricultural Station located in the north-eastern parish of St. Andrew, Sedgepond Sheep Station, also located in St. Andrew and Home Agricultural Station situated in the south-eastern parish of St. Philip.

a. Central Livestock Station (CLS)

Because of spreading urbanisation this station now stands within a built-up residential area and its relocation is being considered. The station runs a 54 head herd of dairy cows which in 1984 produced a little over 96,000 kilograms of milk, roughly 90 per cent of which was sold to the Pine Hill Dairy. Five bulls are kept for the purpose of providing fresh semen for the AI Service.



A small piggery of 15 sows and four boars (Large White and Landrace breeds) helps to supply farmers with purebred weaners for breeding as well as stud service. Three Barbados Blackbelly rams provide Stud services, and a small goat herd of 21 does and 9 bucks provide both kids for sale to goat farmers and a stud service.

In addition to these services CLS provides facilities and technical assistance in the training of secondary school students and 4-H club members in the areas of livestock management and livestock judging. The facilities of the station are also sometimes used for field demonstrations in the training of farmers or technicians associated with livestock development.

b. Greenland Agricultural Station

This station operates a heifer-rearing project under which female calves are brought from farmers when about three days old. They are reared, bred at around 18 months and sold as in-calf heifers to farmers. Because less than the anticipated number of heifer calves are offered for sale to the



project, the facilities are under-utilized, and bull calves are now also being purchased and reared for sale.

There is also on the Greenland Station a sheep production unit which is used for research on the genetic improvement of the Barbados Blackbelly sheep and for multiplication of these sheep to be sold to farmers seeking breeding ewes. Some 413 lambs were produced on the station in 1984 from 187 Blackbelly ewes.

A small pig unit (40 sows at the close of 1984) provides weaners for sale to farmers.

c. Sedgepond Sheep Station

Sedgepond specializes in the production of Barbados Blackbelly lambs for sale to farmers as breeding stock. The station produced 497 lambs in 1984. The flock is grazed during the day on some 14 hectares of fenced hilly land under improved pasture (mainly pangola) with a relatively high level of self-sown leucaena.



As in the case with the Greenland Station manager, the Agricultural Assistant who manages Sedgepond is expected to do some active livestock extension work.

d. Home Agricultural Station

This station has the largest piggery within the Ministry of Agriculture and provides breeding stock to farmers from all parts of the island. Six hundred and fifty-two piglets were sold to farmers in 1984. Housing for pigs on the station is far from optimal, and for extension purposes can be considered mainly a demonstration of features to be avoided in pig housing designs.

The station also provides stud services for farmers' pigs, sheep and goats. The Home Station is managed by an agricultural graduate.

2.10.1.6 Specialist Livestock Extension Services

Livestock extension services operate to a lesser or greater extent in the areas of dairy production, sheep production and pig production.



For dairy extension there is one Senior Agricultural Assistant whose duties, in addition to managing the AI unit, includes the provision of education in dairying to relevant farmers. This officer works closely with the Dairy Extension Consultant of the Agricultural Diversification Project mentioned earlier. There is no MANR Extension Subject-matter Specialist in dairying, and the consultant, whose contract is due to expire very shortly, operates in that capacity.

The clients of the dairy extension programme are some 30 to 32 farmers who sell milk to the Pine Hill Dairy. Herd sizes of the participating farmers reportedly range from 30 to 120-plus milking animals.

A wide range of management systems is found among these farmers, from the most rudimentary to the highly sophisticated utilizing the latest available in dairy equipment. In virtually every case the key problem identified by the dairy extensionists is the inadequate nutrition of the animals. Hence priority extension effort is being devoted to correcting this deficiency. There is no forage agronomist attached to the programme.



The individual farm visit is the extension method mainly used in this programme. Officers sometimes participate two or three times per year in an agriculture subject-matter "call-in" radio programme organized by one local radio station.

A sheep extension programme has recently been initiated, staffed by two agricultural assistants who report directly to the Head of the Livestock Extension and Development Division. There is no extension specialist in sheep production.

The two front-line sheep extension officers work together as a team in visiting sheep farmers, assisting them in keeping records such as lambing dates and weights, weaning weights and ages and so on. The data from these records are to be later analyzed in conjunction with records of management systems and feeding regime, and used in the selection of breeding stock and as the basis for extension recommendations in sheep production.

There is one subject-matter specialist in pig production who operates out of the CLS. This officer devotes much time to Home Agricultural Station in an effort to help improve that station's pig herd and the



services provided to farmers. He however has no front line personnel to support a pig extension programme. Some effort is made however in educating pig producers. The main methods used are individual visits to pig producers and irregular meetings with members of the National Association of Pig Farmers. One appearance on "Agroscope", a television programme produced by the Government Information Service, received wide coverage as evidenced by the comments to the officer from viewers from many parts of the island.

A very serious constraint of the entire livestock extension programme is that there is no agricultural economics and farm management unit attached to the Livestock Extension and Development Division. As a result there is no in-depth economic analysis made of technological innovations before they are recommended for general acceptance by farmers. Technical specialists attempt their own economic appraisal of management systems or technological packages, but these lack the refinements needed in evaluating the relative economic benefits of alternative systems.

2.10.1.7. The Agricultural Information Unit (AIU)

This unit is located in the Headquarters of the MANR at Graeme Hall and reports directly to the Chief Agricultural Officer. The AIU services all Departments of MANR, - crops, livestock, soils, etc. Its functions are to provide support teaching material (audio-visual aids) for all farmer education programmes undertaken by the Ministry, and to itself contribute to the teaching effort through effective usage of the media.

The AIU has a staff of five. The head of the Unit has formal training in agriculture but not in communication, and specifically not in agricultural communication which results in an educational rather than an informational orientation or technique. The assistant to the Head of the Unit has also had no formal training in communication. The third staff member is a photographer who has had formal training in film making. The techniques of film making he can adapt in some measure for making video tapes. Here again, however, his experience has been largely in situations requiring the use of the medium for informational rather than educational purposes. The other members of staff are a graphic artist and an office assistant.



The Unit is presently equipped with a wide range of communication hardware including still cameras and relevant accessories, slide copier, video camera, cassette recorder and video monitor and relevant accessories, tape recorders, overhead and slide projectors, electronic stencil cutter, duplicating machine, etc.

With this equipment and staff, the AIU is capable of producing:

- Black and white colour photographs, regular sizes or enlarged for display.
- Slides and slide sets, including synchronised slide-tapes productions.
- Single colour print productions (fact sheets, pamphlets, bulletins, etc)
- Taped audio programmes for radio or other purposes
- Video programmes.



2.10.2. THE CARIBBEAN AGRICULTURAL RESEARCH AND DEVELOPMENT UNIT (CARDI)

The Caribbean Agricultural Research and Development Institute (CARDI) maintains a unit in Barbados at the Cave Hill Campus of the University of the West Indies, and is involved in both research and extension work in crops and animal production. The unit is headed by an Animal Scientist who is responsible for CARDI's Animal Production Programme in Barbados and other islands of the Eastern Caribbean.

While being involved in research, CARDI's Animal Production Programme is mainly in the area of Extension and Development. In a forage production programme, information generated at the Animal Nutrition Unit and at the CARDI Forage Legume Project is being applied on farms. A Leucaena project provides seedlings of both forage type and giant leucaena to farmers for planting in pastures and in wood lots for timber. A USAID funded project is studying the feasibility of the commercial production of cassava for livestock feed. Results of such work are normally extended to farmers in two ways:

- Field days for farmers who have positively indicated some interest in the particular area of interest. An average of about two field days are reported per year, mainly on forages.



- Extension Bulletins and Fact Sheets are published in collaboration with other specialists and these are distributed free to the farmers. Some of the publications of CARDI currently available to livestock farmers are in, the area of pig production, cattle production, sheep production, poultry and forage and pasture management.

2.10.3. BARBADOS AGRICULTURAL DEVELOPMENT CORPORATION (BADC)

The Barbados Agricultural Development Corporation has no livestock specialist on its staff. The corporation operates one dairy farm on which, the corporation of MANR and CARDI staff, work on pasture systems and introduce grasses is conducted. Farmers are free to visit the farm to observe the pasture management systems. The Integrated Rural Development Project of BADC provides extension services to small farmers of the project mainly in the area of crop production. Under its land redistribution project (Springhall), two dairy farms have been demarcated for distribution.

2.10.4 Barbados Agricultural Society (BAS)

The Barbados Agricultural Society is an umbrella organization for farmers of the nation and provides a central secretariat for the following member groups:

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Barbados Egg and Poultry Producers Association.

Barbados Blackbelly Sheep Association.

Barbados Milk Producers and Dairy Stock Producers Association.

National Association of Pig Farmers.

Food Crop Farmers Association.

The BAS is governed by a Board of Directors and each commodity group has its own Management Committee operating under its own set of bylaws. The parent body provides both marketing and extension services to its members. In the area of marketing, for example, it organises and coordinates the marketing of members' pigs to the two pork processing factories, with which it has a contract to supply 100 pigs per week.

The Society holds occasional educational meetings, seminars, field days and demonstrations, many of these held on farms on a Saturday morning with small groups of farmers. At these field days and demonstration farmers are taught, and given an opportunity to practice such operations as castrating, docking trials, etc. The Society has no extension



field staff but work in collaboration with organizations such as MANR, CARDI, and processors of livestock products. The Society publishes the bi-monthly "BAS Newsletter" which contains several articles and information of use to livestock farmers.

2.10.5 Feed Mills

The two major feed mills, Barbados Feeds, located in Bridgetown and Roberts Manufacturing Company, 2km east of Bridgetown, also offer extension services to their customers. At Barbados Feeds, the sales manager has had a training in animal health. While Roberts Manufacturing Company has on staff a veterinarian and an agricultural college graduate with a diploma in agriculture. In addition to the mills, one major agricultural supplies outlet based in Barbados also offers an advisory service to customers throughout the island through an agricultural college graduate and a trained animal health assistant.



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-1
EVOLUTION OF GDP

YEAR	GDP CURRENT \$	GDP ('000 1974\$)
1975	812442	626992
1976	873479	653875
1977	993562	677973
1978	1112037	710493
1979	1348390	766664
1980	1730551	803763
1981	1904644	782600
1982	1990013	749100
1983	2112677	749200
1984	2303192	779437

SOURCE: Annual Statistical Digest



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-2
ESTIMATED GDP PER CAPITA

YEAR	GDP ('000 1974\$)	POPULATION (thousands)	GDP per capita
1975	626992	246.1	2547.7
1976	653875	246.7	2650.5
1977	677973	247.5	2739.3
1978	710493	248.2	2862.6
1979	766664	248.8	3081.4
1980	803763	249.4	3222.8
1981	782600	250.5	3124.2
1982	749100	251.2	2982.1
1983	749200	251.8	2975.4
1984	779437	252.5	3086.9

SOURCE: Based on Annual Statistical Digest



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-3
BALANCE OF TRADE
(million B'dos \$)

YEAR	IMPORTS	EXPORTS	BALANCE
1975	437.2	216.5	-220.70
1976	473.3	173.6	-299.70
1977	545.1	193.0	-352.10
1978	628.7	261.2	-367.50
1979	850.8	303.9	-546.90
1980	1049.1	455.4	-593.70
1981	1151.1	391.0	-760.10
1982	1107.5	517.5	-590.00
1983	1248.9	646.0	-602.90
1984	1324.6	787.4	-537.20

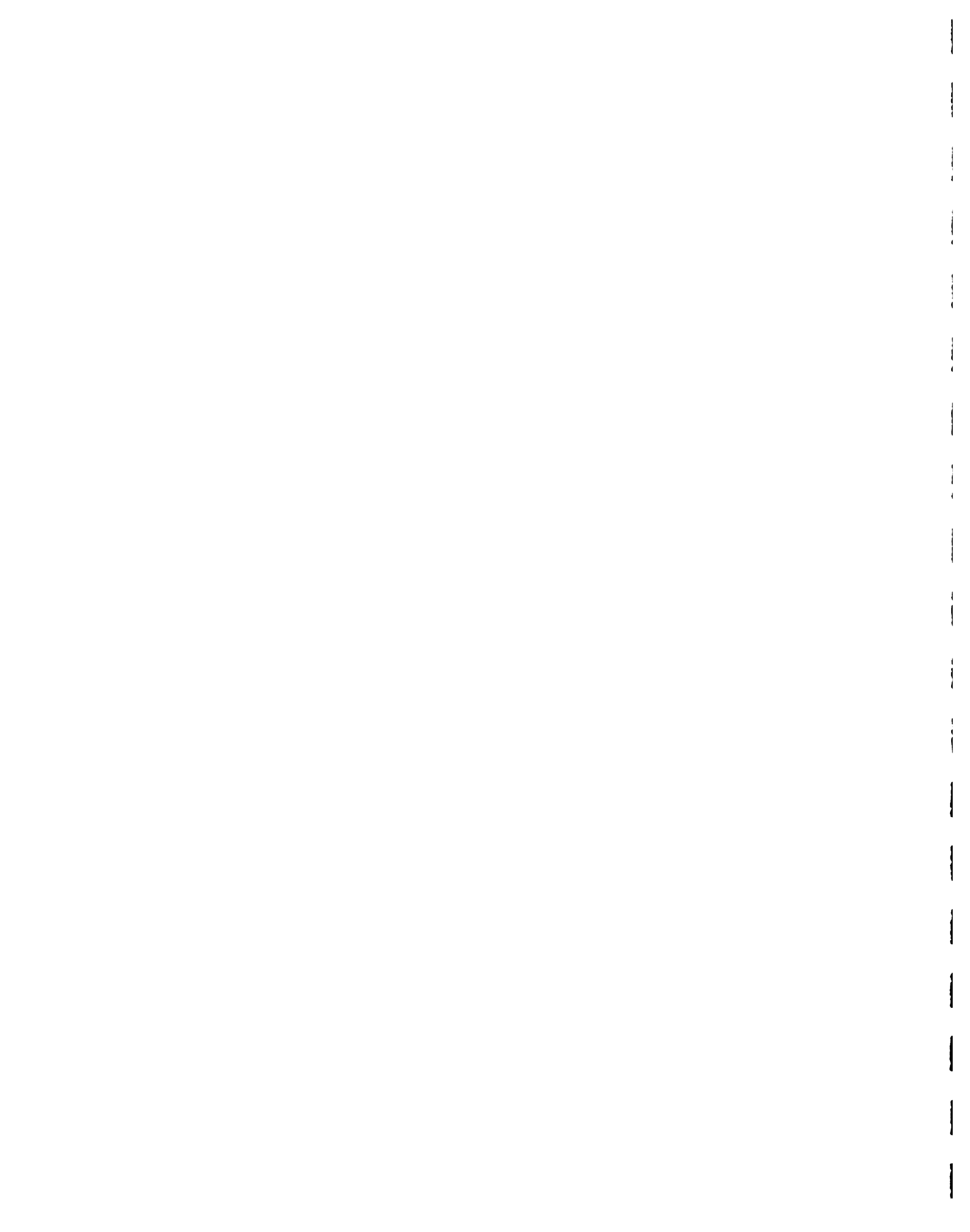
SOURCE: Central Bank, Economic and Financial
Statistical



BARBADOS
 INTEGRATED LIVESTOCK PROJECT
 TABLE II-4
 EXTERNAL DEBT
 ('000 B'dos)

YEAR	EXPORTS	EXTERNAL DEBT	DEBT/EX	DEBT SERVICE	SERV/EX
1975	216.5	44.10	0.20	21.9	0.10
1976	173.6	50.20	0.29	20.2	0.12
1977	193.0	55.10	0.29	30.9	0.16
1978	261.2	89.20	0.34	37.7	0.14
1979	303.9	112.10	0.37	40.8	0.13
1980	455.4	163.90	0.36	50.3	0.11
1981	391.0	259.40	0.66	68.3	0.17
1982	517.5	286.90	0.55	93.1	0.18
1983	646.0	347.30	0.54	84.3	0.13
1984	787.4	365.30	0.46	96.0	0.12

SOURCE: Central Bank, Economic and Financial Statistics



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-5
GROSS DOMESTIC PRODUCT AT CONSTANT PRICES (174=100)
('000 B'dos\$)

SECTOR OF ORIGIN	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Sugar	41680	43834	51093	42991	48517	57570	41580	38004	36256	42637
Non-sugar ag. & fish	24525	27146	21296	29356	29789	24993	26842	28801	33092	33423
Mining and Quarrying	1920	2846	2430	3526	3643	4252	3906	3986	4856	6832
Manufacturing	69289	81005	83574	91217	92783	94824	71410	86481	88730	90373
Electricity and H2O	10095	10765	12298	14213	15804	16838	16498	16783	19485	20425
Construction	44146	49949	43091	46309	52744	56383	58694	51709	51192	51704
Wholesale & Retail	119638	122242	124609	129461	142004	156630	156196	145540	141174	146826
Tourism	56138	57869	77094	86258	107021	110981	103545	89049	67268	93377
Transp. Stor. & Comm	43378	44382	45473	46607	48266	49714	51901	53510	54313	55399
Business & Gen. Serv	120184	118339	121291	123014	126089	128106	130284	133541	133075	137159
Government Serv.	97050	97050	97050	99476	102000	101963	104002	100778	100778	101282
TOTAL	628043	655427	679299	712428	768660	802274	786908	748182	751219	779437

SOURCE: Annual Statistical Digest



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-6
PARTICIPATION OF SECTORS IN THE GROSS DOMESTIC PRODUCT
(%)

SECTOR OF ORIGIN	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Sugar	6.64%	6.69%	7.52%	6.03%	6.31%	7.18%	5.28%	5.08%	4.83%	5.77%
Non-sugar ag. & fish	3.90%	4.14%	3.13%	4.12%	3.88%	3.12%	3.41%	3.85%	4.41%	4.29%
Mining and Quarrying	0.31%	0.45%	0.36%	0.49%	0.47%	0.53%	0.50%	0.53%	0.65%	0.88%
Manufacturing	11.03%	12.36%	12.30%	12.80%	12.07%	11.82%	9.07%	11.56%	11.81%	11.59%
Electricity and H2O	1.61%	1.64%	1.81%	2.00%	2.06%	2.10%	2.10%	2.24%	2.59%	2.62%
Construction	7.03%	7.62%	6.34%	6.50%	6.86%	7.03%	7.46%	6.91%	6.81%	6.63%
Wholesale & Retail	19.05%	18.65%	18.34%	18.17%	18.47%	19.52%	19.85%	19.45%	18.79%	18.84%
Tourism	8.94%	8.83%	11.35%	12.11%	13.92%	13.83%	13.16%	11.90%	11.62%	11.98%
Transp. Stor. & Comm	6.91%	6.77%	6.69%	6.54%	6.28%	6.20%	6.60%	7.15%	7.23%	7.11%
Business & Gen. Serv	19.14%	18.06%	17.86%	17.27%	16.40%	15.97%	16.56%	17.85%	17.71%	17.60%
Government Serv.	15.45%	14.81%	14.29%	13.96%	13.27%	12.71%	13.22%	13.47%	13.42%	12.99%

SOURCE: Based on Annual Statistical Digest



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE 11-7
COMPOSITION OF DOMESTIC EXPORTS
 ('000 \$)

SECTOR OF ORIGIN	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Sugar	95137	46928	50622	47049	58047	109441	51450	61888	37552	57269
Molasses	11761	9343	5841	6716	6935	11862	8265	6932	7139	8365
Rum	4347	4429	5710	5988	2636	3507	4130	5468	4992	6552
Sub total sugar	111245	60700	62173	59753	67618	125310	63845	74288	49183	72186
Shrimp	3092	378	1981	96	23	0	0	0	0	0
Margarine & Lard	2401	3155	3742	5430	4285	6103	4532	3836	4086	4630
Other food and bever.	4804	5178	5348	7221	9730	8042	17009	13808	14442	12660
Sub total other agr.	10297	8711	11071	12747	14038	14145	21541	17644	18528	17290
Chemicals	5539	5869	5624	9267	15174	21694	24219	26249	27238	25911
Electrical components	9492	13766	18260	37859	45075	63349	77257	121725	266322	335906
Clothing	26770	30554	37228	40600	45890	49130	52221	65619	70392	64802
Sports Equipment	60	0	0	1873	8288	10302	8193	285	39	220
Other manufactures	10980	15540	15529	22730	35106	52196	48496	65163	74954	63559
All other	3835	2477	1170	1621	1496	1665	1232	1654	3009	3794
TOTAL	178218	137638	151055	186450	232685	337291	297004	372627	510165	583668

SOURCE: Annual Statistical Digest



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-8
COMPOSITION OF DOMESTIC EXPORTS
(%)

SECTOR OF ORIGIN	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Sugar	53.38%	34.10%	33.51%	25.23%	24.95%	32.45%	17.32%	16.61%	7.36%	9.81%
Molasses	6.60%	6.79%	3.87%	3.60%	2.98%	3.52%	2.78%	1.86%	1.40%	1.43%
Rum	2.44%	3.22%	3.78%	3.21%	1.13%	1.04%	1.39%	1.47%	0.98%	1.12%
Sub total sugar	62.42%	44.10%	41.16%	32.05%	29.06%	37.00%	21.50%	19.94%	9.74%	12.37%
Shrimp	1.73%	0.27%	1.31%	0.05%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Margarine & Lard	1.35%	2.29%	2.48%	2.91%	1.84%	1.81%	1.53%	1.03%	0.80%	0.79%
Other food and bever.	2.70%	3.76%	3.54%	3.87%	4.18%	2.38%	5.73%	3.71%	2.83%	2.17%
Sub total other agr.	5.78%	6.33%	7.33%	6.84%	6.03%	4.19%	7.25%	4.74%	3.63%	2.96%
Chemicals	3.11%	4.26%	3.72%	4.97%	6.52%	6.43%	8.15%	7.04%	5.34%	4.44%
Electrical components	5.33%	10.00%	12.09%	20.31%	19.37%	18.78%	26.01%	32.67%	52.20%	57.55%
Clothing	15.02%	22.20%	24.65%	21.78%	19.72%	14.57%	17.58%	17.61%	13.80%	11.10%
Sports Equipment	0.03%	0.00%	0.00%	1.00%	3.56%	3.05%	2.76%	0.08%	0.01%	0.04%
Other manufactures	6.16%	11.29%	10.28%	12.19%	15.09%	15.48%	16.33%	17.49%	14.69%	10.89%
All other	2.15%	1.80%	0.77%	0.87%	0.64%	0.49%	0.41%	0.44%	0.59%	0.65%

SOURCE: Based on Annual Statistical Digest

BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-9
VALUE OF IMPORTS BY SECTION
(BDS \$'000)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Food	92495	98256	104973	122717	133909	157119	169008	153064	148707	159710
Beverages and Tobacco	9347	9812	11252	11268	16589	20015	23975	21999	19432	17970
Crude Materials inedible except fuels	11090	13993	14343	16798	20669	29092	26372	25928	26382	29464
Lubricants, Minerals, fuels	73827	61689	72266	72873	118963	162115	205165	178256	153712	214126
Animal and Veg. Oils	6356	6643	8098	9563	11099	10729	12662	10888	11838	13424
Chemicals	37163	43700	50834	60839	78845	96721	101702	91147	101188	93193
Manufactured Goods	70384	90810	102244	119507	165795	202752	215753	196360	202705	181055
Machinery and Transport Eq.	79730	82684	101775	125894	196325	256308	288455	316834	465044	475271
Misc. Manufactured Articles	41628	49936	61155	68937	91774	113364	115420	100164	116106	118681
Misc. Commodities & Trans.	15021	16544	18170	19831	14478	15893	7398	11945	12847	23134
TOTAL	437041	474067	545110	628227	848446	1064108	1165910	1106585	1257961	1326028

SOURCE: Barbados Economic Report



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-10
VALUE OF IMPORTS BY SECTION
(%)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Food	21.16%	20.73%	19.26%	19.53%	15.78%	14.77%	14.50%	13.83%	11.82%	12.04%
Beverages and Tobacco	2.14%	2.07%	2.06%	1.79%	1.96%	1.88%	2.06%	1.99%	1.54%	1.36%
Crude Materials inedible except fuels	2.54%	2.95%	2.63%	2.67%	2.44%	2.73%	2.26%	2.34%	2.10%	2.22%
Lubricants, Minerals, fuels	16.89%	13.01%	13.26%	11.60%	14.02%	15.23%	17.60%	16.11%	12.22%	16.15%
Animal and Veg. Oils	1.45%	1.40%	1.49%	1.52%	1.31%	1.01%	1.09%	0.98%	0.94%	1.01%
Chemicals	8.50%	9.22%	9.33%	9.68%	9.29%	9.09%	8.72%	8.24%	8.04%	7.03%
Manufactured Goods	16.10%	19.16%	18.76%	19.02%	19.54%	19.05%	18.51%	17.74%	16.11%	13.65%
Machinery and Transport Eq.	18.24%	17.44%	18.67%	20.04%	23.14%	24.09%	24.74%	28.63%	36.97%	38.84%
Misc. Manufactured Articles	9.52%	10.53%	11.22%	10.97%	10.82%	10.65%	9.90%	9.05%	9.23%	8.95%
Misc. Commodities & Trans.	3.44%	3.49%	3.33%	3.16%	1.71%	1.49%	0.63%	1.08%	1.02%	1.74%

SOURCE: Barbados Economic Report



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-11

IMPORTS BY SECTION AT CONSTANT PRICES (1974=100)
(805 \$ '000)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Deflator	0.7717376	0.748587	0.6823661	0.6389113	0.5685773	0.464455	0.4108904	0.3764297	0.3546212	0.338416
Food	71382	73553	71630	78405	76138	72975	69444	57618	52735	54048
Beverages and Tobacco	7213	7345	7678	7199	9432	9296	9851	8281	6891	6081
Crude Materials inedible except fuels	8559	10475	9787	10732	11752	13512	10836	9760	9356	9971
Lubricants, Minerals, fuels	56975	46180	49312	46559	67640	75295	84300	67101	54510	72464
Animal and Veg. Oils	4905	4973	5526	6110	6311	4983	5203	4099	4198	4543
Chemicals	28680	32713	34687	38871	44829	44923	41788	34310	35883	31538
Manufactured Goods	54318	67979	69768	76354	94267	94169	88651	73916	71883	61272
Machinery and Transport Eq.	61531	61896	69448	80435	111626	119044	118523	119266	164914	160839
Misc. Manufactured Articles	32126	37381	41730	44045	52181	52652	47425	37705	41174	40164
Misc. Commodities & Trans.	11592	12385	12399	12670	8232	7382	3040	4496	4556	7829

SOURCE: Based on Barbados Economic Report



Table No. 12

VALUE OF BEEF IMPORTS
('000 B'dos \$)

Commodity Name:	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Beef:										
Meat of Bovine Animals	6829.8	9986.0	9573.3	13125.3	14196.8	15561.5	15551.7	13226.2	12738.9	13916.5
Beef Salted in Brine	474.1	711.2	830.4	1044.0	840.7	1270.9	907.1	851.4	793.8	725.3
Beef smoked or dried	2.4	2.5	12.9	15.8	10.0	0.0	0.0	0.0	8.7	9.5
Corned Beef	2995.2	3798.0	4375.0	4273.9	4914.2	4572.5	4063.1	3998.3	4798.2	4071.4
GRAND TOTAL	10301.9	14497.7	14791.6	18459.0	19961.7	21404.9	20521.9	18075.9	18339.6	18722.7

SOURCE:Ag. Planning Unit-MANR



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-13
VOLUME OF BEEF IMPORTS
(metric tons.)

Commodity Name:	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Beef:										
Meat of Bovine Animals	2493.3	3457.4	3159.2	3789.3	2591.3	2419.8	2404.6	2172.5	2280.0	2172.5
Beef Salted in Brine	234.9	331.9	459.2	404.1	328.1	283.3	578.7	244.1	210.6	195.5
Beef smoked or dried	0.9	0.3	1.1	2.4	1.5	0.0	0.0	0.0	1.0	1.0
Corned Beef	714.9	109.3	1130.8	1156.6	1298.1	672.6	613.1	912.6	1228.3	970.3
TOTAL	3444	3898.9	4750.3	5352.4	4219	3375.7	3596.4	3329.2	3719.9	3339.3

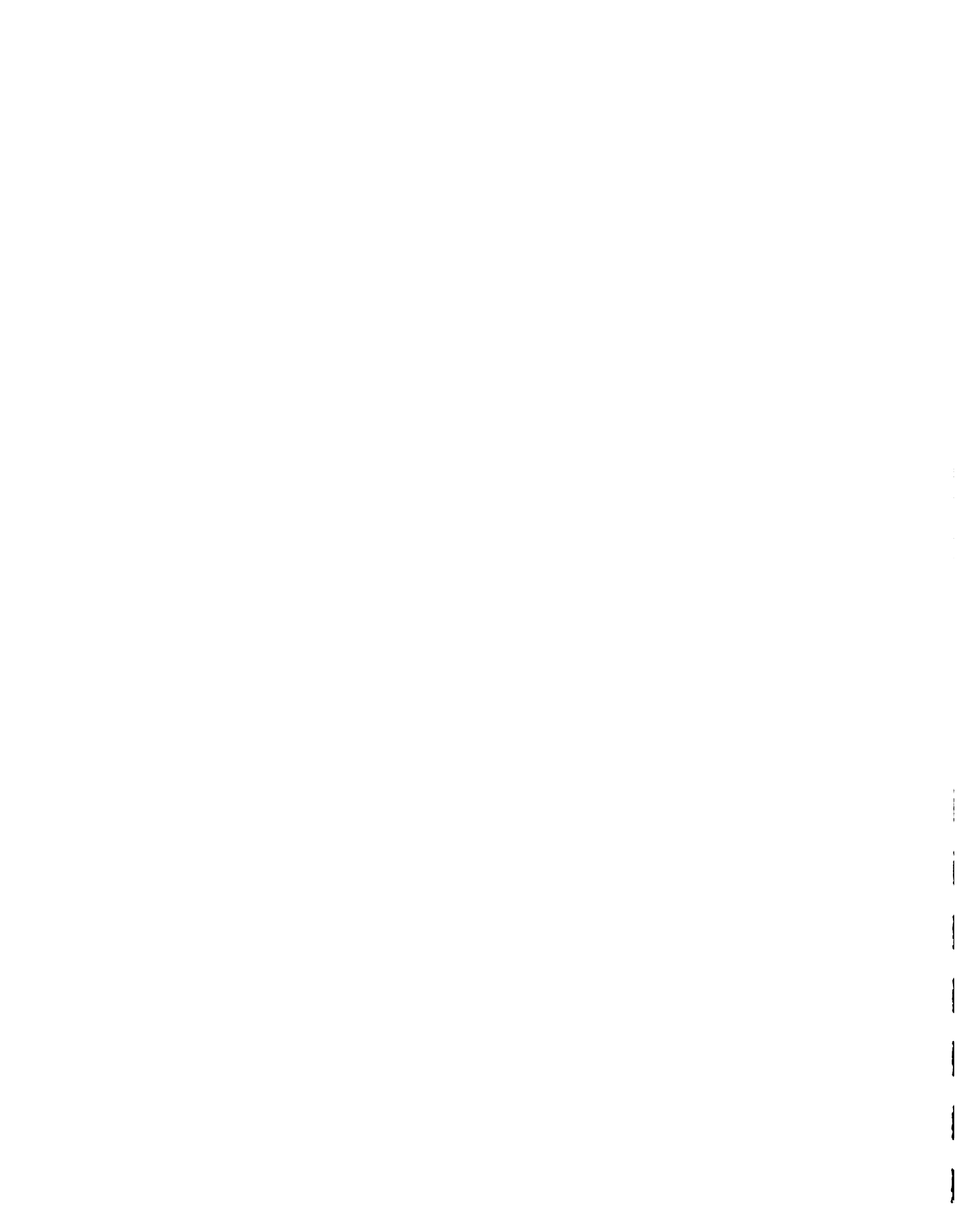
SOURCE: Ag. Planning Unit - MANR



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-14
IMPORTS OF MUTTON

YEAR	VOLUME (M.T.)	VALUE ('000 B'dos \$)	UNIT PRICE
1975	483.7	1052.5	2.2
1976	553.5	1268.1	2.3
1977	691.8	1862.9	2.7
1978	493.1	1624.5	3.3
1979	676.5	2415.3	3.6
1980	932.0	3454.6	3.7
1981	778.7	3598.9	4.6
1982	891.9	3794.6	4.3
1983	1020.0	3290.0	3.2
1984	1366.0	4856.7	3.6

SOURCE: Ag. Planning Unit-MANR



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-15
VALUE OF PORK IMPORTS
(B'dos \$)

Commodity Name:	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Pork:										
Meat of Swine	166587	175654	110	1082641	1442936	1599240	1843388	1404759	2357296	2761627
Pig Trotters	399449	291075	281175	175767	258601	255939	218820	269709	146791	204882
Pork Salted in Brine	2108538	2184396	1488298	1690398	2006850	2361306	1638753	1006751	655354	608758
Bacon dried or smoked	673079	983112	727129	655147	1061285					
Ham dried or smoked	1149454	1503207	1635348	1371399						
Other Pig Meat	32907	1941	3240	2178						
Bacon not dri. or sm.	68477	32550	25179	4450						
Ham not dri. or sm.	1443064	1140724	369636	439						
Bacon					1056740	919523	1055176	47007	743505	1739
Ham					429137	229081	27728	117620	35476	50661
Ham canned						7354	109433	1131275	8849	1237
Ham not canned					134931	483454	210887	172864	15332	5447
Sausages canned					116869	120849	223969	320956	386956	341618
Sausages not canned					200455	280428	508402	331319	369935	203087
Bacon not canned							6351	33216		165
TOTAL	6041555	6312659	4530115	4982419	6707804	6257174	5842907	4835476	4719494	4179221

SOURCE: Ag. Planning Unit - MANR



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-16
VOLUME OF PORK IMPORTS
(metric tons.)

Commodity Name:	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Pork:										
Meat of Swine	91.9	62.2	0.0	324.8	581.3	373.3	459.6	330.2	586.7	736.6
Pig Trotters	355.8	273.4	269.5	154.1	214.2	204.3	161.8	192.2	117.5	164.5
Pork Salted in Brine	1129.2	1110.7	900.5	914.4	920.6	1102.0	2437.7	334.6	233.5	241.9
Bacon dried or smoked	105.9	161.5	129.3	128.3	272.8					
Ham dried or smoked	234.6	337.5	519.3	264.9						
Other Pig Meat	21.8	0.1	0.9	1.1						
Bacon not dri. or sm.	10.5	5.1	4.5	1.1						
Ham not dri. or sm.	297.3	224.3	68.4	0.0						
Bacon					263.8	199.8	905.8	4.9	108.8	0.1
Ham					70.1	25.1	2.1	16.3	1.8	2.4
Ham canned					0.0	0.9	11.1	12.2	1.1	0.1
Ham not canned					19.8	70.4	35.7	287.7	2.6	0.6
Sausages canned					41.5	16.3	74.0	53.1	67.6	64.2
Sausages not canned					31.1	37.9	59.7	43.8	54.6	25.7
Bacon not canned							1.0	5.5		0.0

SOURCE: Ag. Planning Unit -MANR



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-17
IMPORTS OF DAIRY PRODUCTS
 ('000 B'dos \$)

CONCEPT	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Milk unsweet. >8% fat	363.1	5.8	92.0	1.6	3.3	21.7	0.3		2.5	
Milk sweet. >8% fat	123.0	0.0	3.0	379.9	20.8	750.3				1010.6
Milk in solid >8% fat	445.9	323.6	128.2	443.9	227.6	5.2	638.0	373.8	333.4	838.0
Other milk >8% fat					358.9	5.8				
Total >8% fat	932.0	329.4	223.2	825.4	610.6	783.0	638.3	373.8	335.9	1848.6
Milk unsweet. <8% fat	0.2	0.0	0.1	0.0	0.2	2033.1	13.9			12.2
Milk sweet. <8% fat	473.6	0.8	504.7	367.1	0.0					726.3
Milk in solid <8% fat	1354.1	1134.2	1220.6	1911.2	2063.1	4793.0	3208.0	2527.0	3135.0	2938.4
Other milk <8% fat					102.4	7.7			6.2	23.6
Total <8% fat	1827.9	1135.0	1725.4	2278.3	2165.7	6833.8	3221.9	2527.0	3141.2	3700.5
Cream fresh	20.5	18.2	24.8	15.1	10.1	11.1	4.1	0.2		4.1
Subtotal milk & cream	2780.4	1482.6	1973.4	3118.8	2786.4	7627.9	3864.3	2901.0	3477.1	5553.2
Butterfat	132.6	67.8	67.3	16.5	0.0	5429.0	0.1		2.5	
Butter fresh or salt.	1699.0	1963.9	1567.6	232.2	2255.1	2333.0	2073.0	1374.0	2227.0	1420.3
Other butter incl.ghee	4.8	0.0	0.0	18.6	8.4	463.8	14417.0	1.3	6.6	18.3
Subtotal butter	1836.4	2031.7	1634.9	267.3	2263.5	8225.8	16490.1	1375.3	2236.1	1438.6
Cheese and curd	2702.6	2635.9	2708.7	3819.1	4966.9	8.0	5877.0	6598.0	5633.0	5061.7
TOTAL	7319.4	6150.2	6317.0	7205.2	10016.8	15861.7	26231.4	10874.3	11346.2	12053.5

SOURCE: Ag. Planning Unit



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-18
IMPORTS OF DAIRY PRODUCTS
 (metric tons.)

CONCEPT	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Milk unsweet. >8% fat	306.2	2.4	36.4	0.4	0.7	3.5	0.1			20.6
Milk sweet. >8% fat	92.0	0.0	0.4	47.8	7.5	415.8				539.5
Milk unsweet. <8% fat	0.1	0.0	0.0	218.9	0.1	502.8	5.0			4.9
Milk sweet. <8% fat	99.6	185.6	222.9	0.0	0.0					396.0
Milk in solid >8% fat	195.8	158.7	95.5	49.1	45.3	1.1	100.3	61.1	3.8	171.9
Milk in solid <8% fat	760.6	1065.6	1125.0	1457.8	961.9	1809.3	891.7	983.6	1337.8	1347.3
Cream fresh	4.8	4.9	6.0	3.3	1.7	603.0	0.7			0.6
Butterfat	40.8	44.9	25.9	3.5	0.0	1179.1			0.5	0.0
Butter fresh or salt.	536.6	692.3	600.1	713.3	602.2	5918.0	369.0	249.0	452.0	593.2
Other butter incl. ghee	1.1	0.0	0.0	5.1	1.5	3073.9	1633.0	0.1	1.1	3.4
Cheese and curd	865.0	963.5	951.7	1075.3	1185.6	625.0	1249.0	1682.0	1382.0	1384.2
Milk fresh	0.0	0.0	0.0	0.5	0.0					

SOURCE: Ag. Planning Unit - MANR



BARBADOS
TABLE II-19
INTEGRATED LIVESTOCK PROJECT
NUMBER OF HEADS OF LIVESTOCK BY TYPE OF HOLDINGS

SIZE GROUP	N. OF HOLDINGS	CATTLE		SHEEP		GOATS	
		NUMBER	%	NUMBER	%	NUMBER	%
WITHOUT LAND	13159	2152	30.4%	15607	57.7%	3126	58.0%
<1 ACRE	9298	1579	22.3%	7022	25.9%	1435	26.6%
1 - 5 ACRES	3170	1252	17.7%	3284	12.1%	722	13.4%
5 - 10 ACRES	161	147	2.1%	251	0.9%	58	1.1%
10 - 25 ACRES	68	122	1.7%	193	0.7%	9	0.2%
25 - 50 ACRES	23	131	1.8%	180	0.7%	19	0.4%
50 - 100 ACRES	16	265	3.7%	19	0.1%	2	0.0%
100 - 200 ACRES	31	369	5.2%	26	0.1%	0	0.0%
200 - 500 ACRES	80	733	10.4%	376	1.4%	11	0.2%
500 + ACRES	46	332	4.7%	106	0.4%	4	0.1%
TOTAL	26052	7082	100.0%	27064	100.0%	5386	100.0%

SOURCE: 1971 Agricultural Census



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-20
NUMBER OF HEADS AND TYPE OF LIVESTOCK BY TYPE OF HOLDINGS

SIZE GROUP	N. OF HOLDINGS	TOTAL NUM. HEADS	%	DAIRY CATTLE				OTHER CATTLE				MILK PRODUCED IN ONE DAY (GALLONS)
				UNDER 2 YEARS		> 2 YEARS		UNDER 2 YEARS		> 2 YEARS		
				MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	
WITHOUT LAND	1370	2152	30.4%	104	693	34	1036	72	99	29	85	838
< 1 ACRE	1173	1579	22.3%	69	512	14	778	40	73	17	76	7562
1 - 5 ACRES	805	1252	17.7%	57	402	11	626	15	66	9	66	496
5 - 10 ACRES	64	147	2.1%	7	35	4	83	3	7	0	8	84
10 - 25 ACRES	24	122	1.7%	3	18	2	61	3	0	20	15	140
25 - 50 ACRES	10	131	1.8%	4	39	0	73	4	2	9	0	127
50 - 100 ACRES	8	265	3.7%	2	113	0	117	7	5	10	11	596
100 - 200 ACRES	17	369	5.2%	14	85	4	188	14	20	0	44	322
200 - 500 ACRES	48	733	10.4%	13	207	5	371	6	43	12	76	621
500 + ACRES	24	332	4.7%	9	110	0	155	8	12	4	34	186
TOTAL	3493	7082	100.0%	282	2214	74	3488	172	327	110	415	10972



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE 11-21
MILK PRODUCTION BY TYPE OF HOLDING

SIZE GROUP	FEMALE DAIRY CATTLE		MILK PRODUCTION		MILK PRODUCTION PER HEAD
	NUMBER	%	GALLONS	%	
WITHOUT LAND	1036	29.7%	838	7.6%	0.81
<1 ACRE	778	22.3%	7562	68.9%	9.72
1 - 5 ACRES	626	17.9%	496	4.5%	0.79
5 - 10 ACRES	83	2.4%	84	0.8%	1.01
10 - 25 ACRES	61	1.7%	140	1.3%	2.30
25 - 50 ACRES	73	2.1%	127	1.2%	1.74
50 - 100 ACRES	117	3.4%	596	5.4%	5.09
100 - 200 ACRES	188	5.4%	322	2.9%	1.71
200 - 500 ACRES	371	10.6%	621	5.7%	1.67
500 + ACRES	155	4.4%	186	1.7%	1.20
TOTAL	3488	100.0%	10972	100.0%	3.15

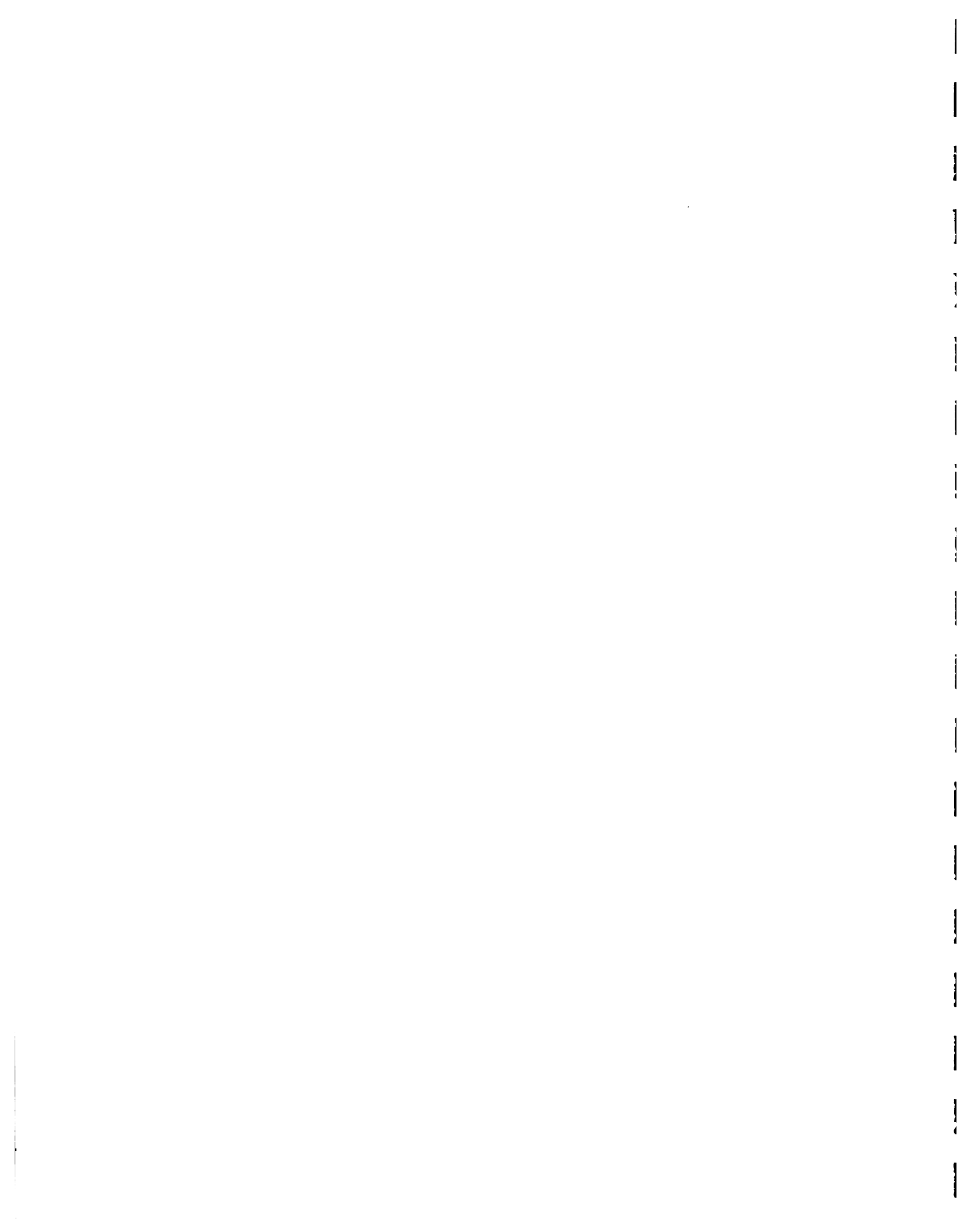
SOURCE: Based on 1971 Ag. Census



BARBADOS
 INTEGRATED LIVESTOCK PROJECT
 TABLE 11-22
 NUMBER OF HEADS AND TYPE OF LIVESTOCK BY PARISH

SIZE GROUP	M. OF HOLDINGS REPORTING	TOTAL NUM. HEADS		DAIRY CATTLE				OTHER CATTLE				MILK PRODUCED IN ONE DAY (GALLONS)
		NUMBER	%	UNDER 2 YEARS		> 2 YEARS		UNDER 2 YEARS		> 2 YEARS		
				MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	
ST. MICHAEL	346	804	11.4%	28	239	12	451	28	26	13	7	580
CHRIST CHURCH	441	724	10.2%	33	229	8	391	13	16	11	23	413
ST. GEORGE	325	548	7.7%	21	218	4	261	6	12	3	23	255
ST. PHILIP	623	1043	14.7%	40	340	6	523	21	54	21	38	392
ST. JOHN	208	406	5.7%	17	148	2	169	10	18	2	40	95
ST. JAMES	284	637	9.0%	33	225	13	254	21	42	17	32	741
ST. THOMAS	238	525	7.4%	26	173	12	255	3	33	3	20	321
ST. JOSEPH	176	375	5.3%	8	144	7	172	15	13	6	10	210
ST. ANDREW	393	1016	14.3%	30	232	7	535	22	49	19	122	7376
ST PETER	236	420	5.9%	20	103	2	237	14	23	6	15	137
ST. LUCY	223	584	8.2%	26	163	1	240	19	41	9	85	452
TOTAL	3493	7082	100.0%	282	2214	74	3488	172	327	110	415	10972

SOURCE: 1971 Agricultural Census



BARBADOS
 INTEGRATED LIVESTOCK PROJECT
 TABLE II-23
 DAIRY ANIMALS AND MILK PRODUCED
 BY PARISH

PARISH	TOTAL DAIRY COWS		MILK PRODUCED IN ONE DAY (GALLONS)	MILK PRODUCED PER HEAD (GALLONS)	
	NUMBER	%		%	
ST. MICHAEL	451	12.9%	580	5.3%	1.29
CHR. ST CHURCH	391	11.2%	413	3.8%	1.06
ST. GEORGE	261	7.5%	255	2.3%	0.98
ST. PHILIP	523	15.0%	392	3.6%	0.75
ST. JOHN	169	4.8%	95	0.9%	0.56
ST. JAMES	254	7.3%	741	6.8%	2.92
ST. THOMAS	255	7.3%	321	2.9%	1.26
ST. JOSEPH	172	4.9%	210	1.9%	1.22
ST. ANDREW	535	15.3%	7376	67.2%	13.79
ST PETER	237	6.8%	137	1.2%	0.58
ST. LUCY	240	6.9%	452	4.1%	1.88
TOTAL	3488	100.0%	10972	100.0%	3.15

SOURCE: Based on 1971 Ag. Census figures

BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-24

MALE-FEMALE RELATIONSHIP PER TYPE OF ANIMAL AND PARISH

DAIRY

NON-DAIRY

PARISH	< 2YEARS		> 2YEARS		< 2YEARS		> 2YEARS							
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE						
ST. MICHAEL	23	239	10.8%	10.8%	12	451	12.9%	16.3%	26	8.0%	13	11.8%	7	1.7%
CHRIST CHURCH	33	229	11.7%	10.3%	8	391	11.2%	7.6%	16	4.9%	11	10.0%	23	5.3%
ST. GEORGE	21	218	7.4%	9.8%	4	261	7.5%	3.5%	12	3.7%	3	2.7%	23	5.5%
ST. PHILIP	40	340	14.2%	15.4%	6	523	15.0%	12.2%	54	16.5%	21	19.1%	38	9.2%
ST. JOHN	17	148	6.0%	6.7%	2	169	4.8%	5.8%	18	5.5%	2	1.8%	40	9.6%
ST. JAMES	33	225	11.7%	10.2%	13	254	7.3%	12.2%	42	12.8%	17	15.5%	32	7.7%
ST. THOMAS	25	173	9.2%	7.8%	12	255	7.3%	1.7%	33	10.1%	3	2.7%	20	4.8%
ST. JOSEPH	8	144	2.9%	6.3%	7	172	4.9%	8.7%	13	4.0%	6	5.5%	10	2.4%
ST. ANDREW	30	232	10.6%	10.5%	7	535	15.3%	12.8%	49	15.0%	19	17.3%	122	29.4%
ST. PETER	20	103	7.1%	4.7%	2	237	6.8%	8.1%	23	7.0%	6	5.5%	15	3.6%
ST. LUCY	24	163	9.2%	7.4%	1	240	6.9%	11.0%	41	12.5%	9	8.2%	85	20.5%
TOTAL	282	2214	100.0%	100.0%	74	3488	100.0%	100.0%	327	100.0%	110	100.0%	415	100.0%

SOURCE: Based on 1971 Agricultural Census

BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-25
NUMBER OF HEADS AND TYPE OF SHEEP BY TYPE OF HOLDINGS

SIZE GROUP	N. OF HOLDINGS REPORTING	TOTAL NUM. HEADS		LAMBS		OTHER	
		NUMBER	%	< 1 YR.	%	> 1 YR.	%
WITHOUT LAND	5841	15607	57.7%	5759	56.7%	9848	58.2%
<1 ACRE	2685	7022	25.9%	2661	26.2%	4361	25.8%
1 - 5 ACRES	1065	3284	12.1%	1239	12.2%	2045	12.1%
5 - 10 ACRES	52	251	0.9%	94	0.9%	157	0.9%
10 - 25 ACRES	16	193	0.7%	58	0.6%	135	0.9%
25 - 50 ACRES	8	180	0.7%	101	1.0%	79	0.5%
50 - 100 ACRES	5	19	0.1%	2	0.0%	17	0.1%
100 - 200 ACRES	6	26	0.1%	8	0.1%	18	0.1%
200 - 500 ACRES	37	376	1.4%	169	1.7%	207	1.2%
500 + ACRES	13	106	0.4%	59	0.6%	47	0.3%
TOTAL	9728	27064	100.0%	10150	100.0%	16914	100.0%

SOURCE: 1971 Agricultural Census



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-26
NUMBER OF HEADS AND TYPE OF SHEEP BY PARISH

SIZE GROUP	N. OF HOLDINGS REPORTING	TOTAL NUM. HEADS		LAMBS		OTHER	
		NUMBER	%	< 1 YR.	%	> 1 YR.	%
ST. MICHAEL	1453	3337	12.3%	1393	13.7%	1944	11.5%
CHRIST CHURCH	1520	4212	15.6%	1612	15.9%	2600	15.4%
ST. GEORGE	821	1847	6.8%	924	8.1%	1023	6.0%
ST. PHILIP	1728	5747	21.2%	1985	19.6%	3762	22.2%
ST. JOHN	469	1263	4.7%	469	4.6%	794	4.7%
ST. JAMES	591	1683	6.2%	625	6.2%	1058	6.3%
ST. THOMAS	421	932	3.4%	363	3.6%	569	3.4%
ST. JOSEPH	325	789	2.9%	267	2.6%	522	3.1%
ST. ANDREW	597	1801	6.7%	658	6.5%	1143	6.8%
ST. PETER	705	2065	7.6%	760	7.5%	1305	7.7%
ST. LUCY	1118	3388	12.5%	1194	11.8%	2194	13.0%
TOTAL	9748	27064	100.0%	10150	100.0%	16914	100.0%

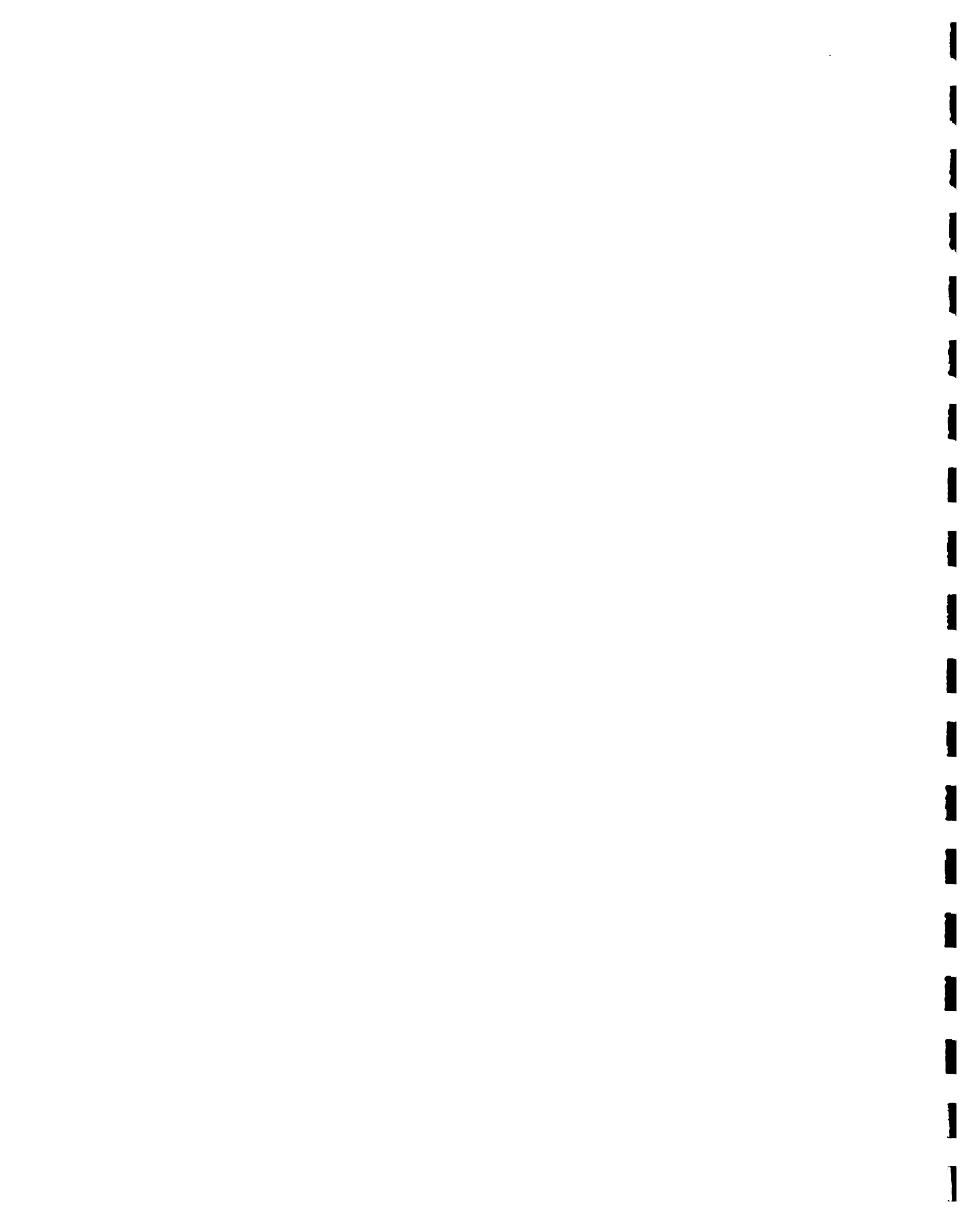
SOURCE: Barbados Statistical Service



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-27
FARM POPULATION BY AGE AND PARISH

PARISH	N. OF HOLDINGS REPORTING	UNDER 15	15 - 64	65+	TOTAL	%
ST. MICHAEL	5771	8085	15882	1695	25662	24.2%
CHRIST CHURCH	3349	5031	8912	999	14942	14.1%
ST. GEORGE	2312	3729	6105	791	10625	10.0%
ST. PHILIP	2708	4537	7068	911	12516	11.8%
ST. JOHN	1434	2461	3889	457	6807	6.4%
ST. JAMES	1530	2157	3848	527	6532	6.2%
ST THOMAS	1195	2247	3176	371	5794	5.5%
ST. JOSEPH	1036	1872	2695	346	4913	4.6%
ST. ANDREW	1122	2162	2779	342	5283	5.0%
ST PETER	1324	2232	3487	381	6100	5.8%
ST. LUCY	1561	2490	3656	508	6654	6.3%
TOTAL	23342	37003	61497	7328	105828	100.0%

SOURCE: 1971 Agricultural Census



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE 11-28
AVERAGE RETAIL PRICE OF MEAT PRODUCTS
(B'dos \$/Kg)

PRODUCT	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Chicken (whole)	4.00	4.00	4.00	4.00	4.51	4.52	5.55	5.15	5.55	6.17
Chicken (backs)	N/A	N/A	N/A	N/A	N/A	1.28	N/A	1.33	1.65	2.09
Beef:	2.88	4.03	N/A	3.85	6.95	N/A	N/A	N/A	N/A	N/A
clod	N/A	N/A	N/A	N/A	N/A	8.65	8.35	8.84	9.15	9.09
stew	N/A	N/A	N/A	N/A	N/A	7.16	7.56	7.56	7.99	7.61
ground	N/A	N/A	N/A	N/A	N/A	N/A	6.00	6.00	6.60	6.60
sirloin steak	N/A	N/A	4.40	N/A	7.04	N/A	N/A	N/A	N/A	N/A
Mutton (lamb)	4.73	4.40	N/A	4.40	5.50	5.82	7.99	8.10	8.42	7.80
Pork chops	3.15	5.83	4.64	6.05	8.54	8.28	9.50	9.78	10.39	13.31

SOURCE: Barbados Statistical Service



BARBADOS
 INTEGRATED LIVESTOCK PROJECT
 TABLE II-29
 SUPPLY OF MEAT BY SOURCE

	INTERNAL PRODUCTION	IMPORTED	TOTAL SUPPLY	% LOCAL OF TOTAL
Beef & Veal	278600	3339300	3617900	7.5%
Mutton	19800	1366000	1385800	1.4%
Pork	741700	1236100	1977800	37.5%

SOURCE: Ag. Planning Unit - MANR



BARBADOS
 INTEGRATED LIVESTOCK PROJECT
 TABLE II-30
 SCHEDULES OF SLAUGHTERING FEES

	MINIMUM \$	MAXIMUM \$
CATTLE AND CALVES		
Less than 70kg	10.00	
70 to 120kg	11.00	15.00
120 to 195kg	16.00	20.00
195 to 270kg	21.00	25.00
270 to 345kg	26.00	30.00
345 to 420kg	31.00	35.00
420 to 480kg	36.00	39.00
More than 480kg	40.00	
SHEEP AND GOATS		
Less than 35kg	8.00	
35 to 50kg	9.00	11.00
More than 50kg	12.00	
PIGS		
Less than 70kg	8.00	
70 to 85kg	10.00	12.00
85 to 145kg	13.00	18.00
More than 145kg	19.00	

Note: Fees increased \$1.00 for each 10kg increased from 70 to 120kg and for each 15kg from 120 up for cattle and calves. Sheep and goat fee increased by \$1.00 for each 5kg increased up to 50kg. Pig fees increased by \$1.00 for each 5kg up to 85kg and for each 10kg from 85 to 145kg.

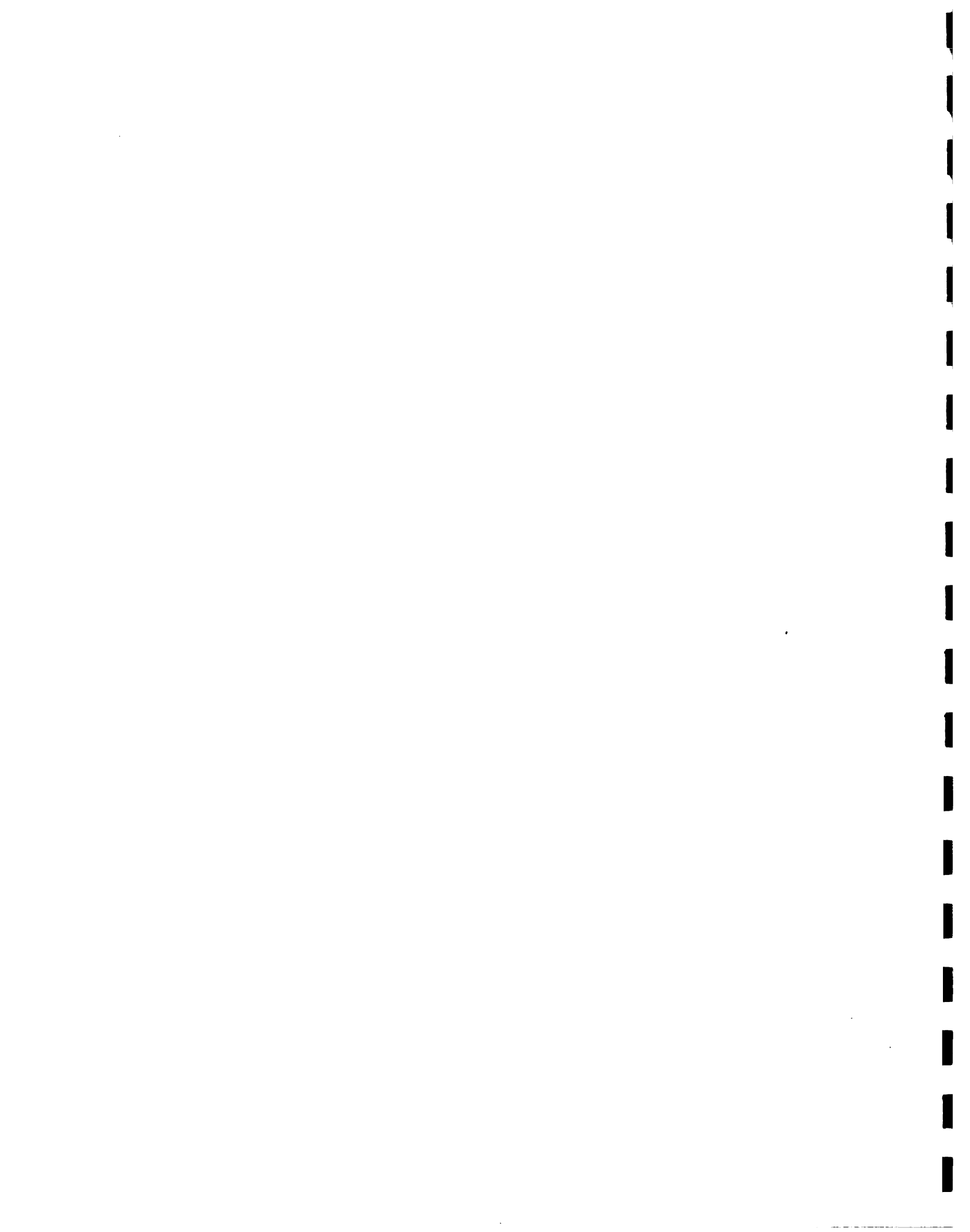
SOURCE: BARBADOS MARKETING CORP.



BARBADOS
INTEGRATED LIVESTOCK PROJECT
TABLE II-31
ABATTOIR SECTION REPORT - 1985

YEAR	COWS			BULLS			PIGS			CALVES			SHEEP NO.	GOATS NO.	TOTAL NO. SLAUGHTERED
	NO.	WT. (Kgs)	NO.	WT. (Kgs)	NO.	WT. (Kgs)	NO.	WT. (Kgs)	NO.	WT. (Kgs)	NO.	WT. (Kgs)			
JANUARY	45	15745	42	14035	759	59555	4	540	139				3		992
FEBRUARY	31	11650	30	11315	658	51050	8	980	94				3		824
MARCH	40	14480	41	13235	692	56515	9	1125	113				5		900
APRIL	35	12435	31	10700	773	65005	9	985	81				9		938
MAY	41	15100	30	10595	835	68664	9	1785	70				3		988
JUNE	33	12090	24	7740	745	63173	9	1000	74				5		891
JULY	48	16535	28	9875	944	82496	8	955	98				5		1131
AUGUST	31	9645	34	11620	775	66765	8	830	94				4		949
SEPTEMBER	34	11937	26	8870	794	69040	2	250	60				4		920
OCTOBER	40	13950	35	12470	859	77210	4	585	109				1		1058
NOVEMBER	30	10695	28	9620	823	73250	7	1085	116				4		1008
DECEMBER	28	9345	37	12440	1001	85175	2	215	67				2		1137
TOTALS	436	152597	386	132115	9672	817898	79	10335	1115				48		11736

SOURCE: Barbados Marketing Corporation



BARBADOS
 INTEGRATED LIVESTOCK PROJECT
 TABLE II-32
 ANNUAL SLAUGHTER BY THE
 BARBADOS MARKETING CORPORATION 1980-1985

YEAR	CATTLE	PIGS	CALVES	SHEEP	GOATS	TOTAL
1980	1432	10223	351	2992	192	15180
1981	637	4910	131	1088	69	6835
1982	1245	10342	103	1034	58	12782
1983	1253	11299	91	1463	105	14211
1984	1016	8735	65	1044	77	10937
1985	822	9672	79	415	48	11036

SOURCE: Barbados Marketing Corporation



BARRADOS
 INTEGRATED LIVESTOCK PROJECT
 TABLE II-12

AVERAGE PRICES AND SALES MARK-UPS AND MARGINS OF MEAT

MARKUPS

CONCEPT	D.I.F. PRICES		WHOLESALE		RETAIL		MARKDOWNS	
	PRICES	MARGIN	PRICES	MARGIN	PRICES	MARGIN	WHOLESALE	RETAIL
BEEF CLOD	4.57	35%	6.16	35%	8.93	45%	25%	31%
IRISH BEEF STEW	2.50	58%	3.96	58%	4.76	20%	37%	22%
N.Z. BEEF STEW	4.50	27%	5.84	27%	7.50	18%	21%	22%
MUTTON SHOULDER	2.53	43%	3.83	43%	7.39	98%	30%	50%
LAMB LEG	4.53	43%	6.50	43%	9.25	42%	30%	30%
SIMPLE AVERAGE				41%		46.6%	28.6%	30%

SOURCE: Our estimates based on interviews

Mark-up wholesale = Increase in price/Purchase Price CIF


Mark-up retail = Increase in price/Wholesale Price

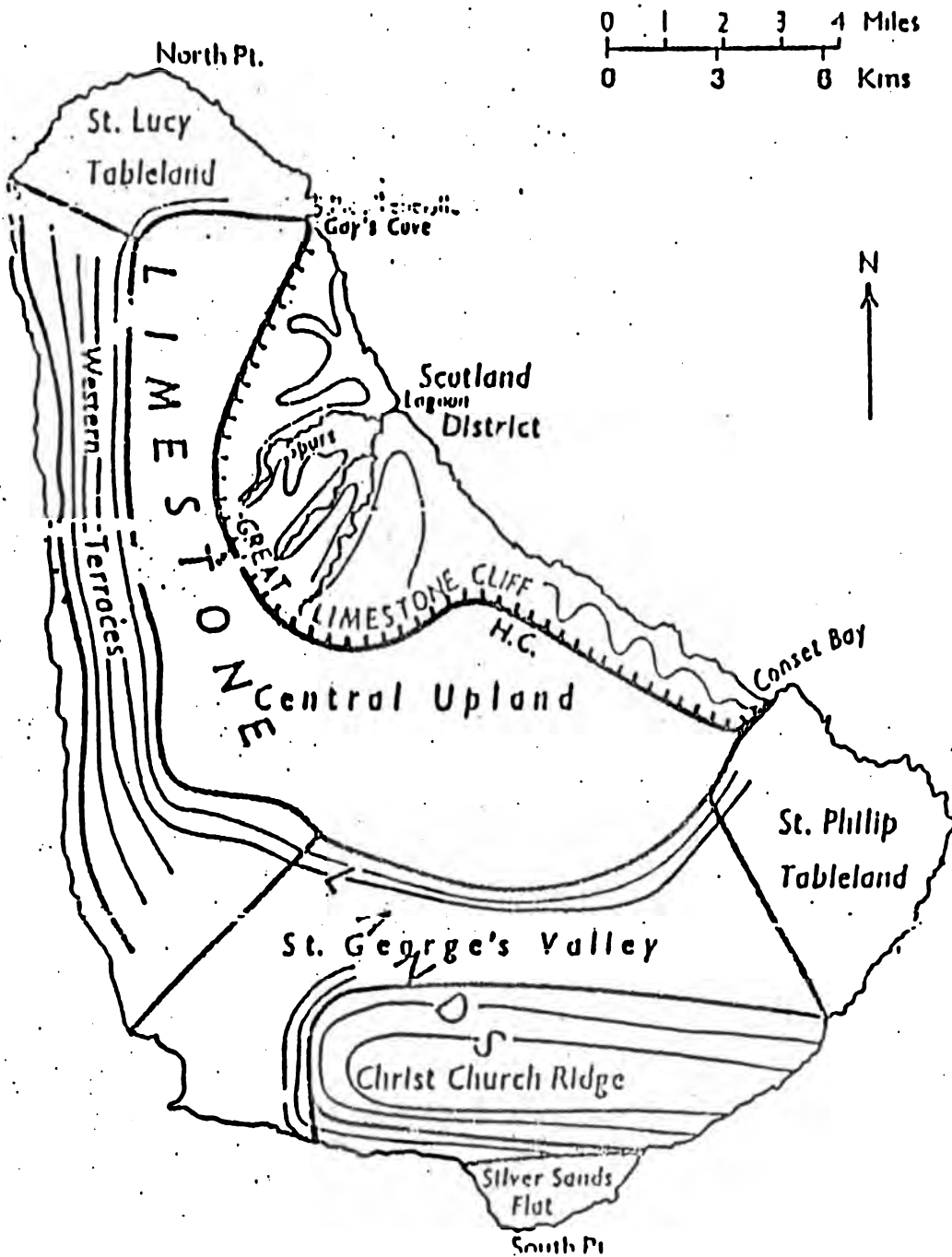
Margins = Increase in price/Sale price



BARBADOS
INTEGRATED LIVESTOCK PROJECT
FIGURE II-1

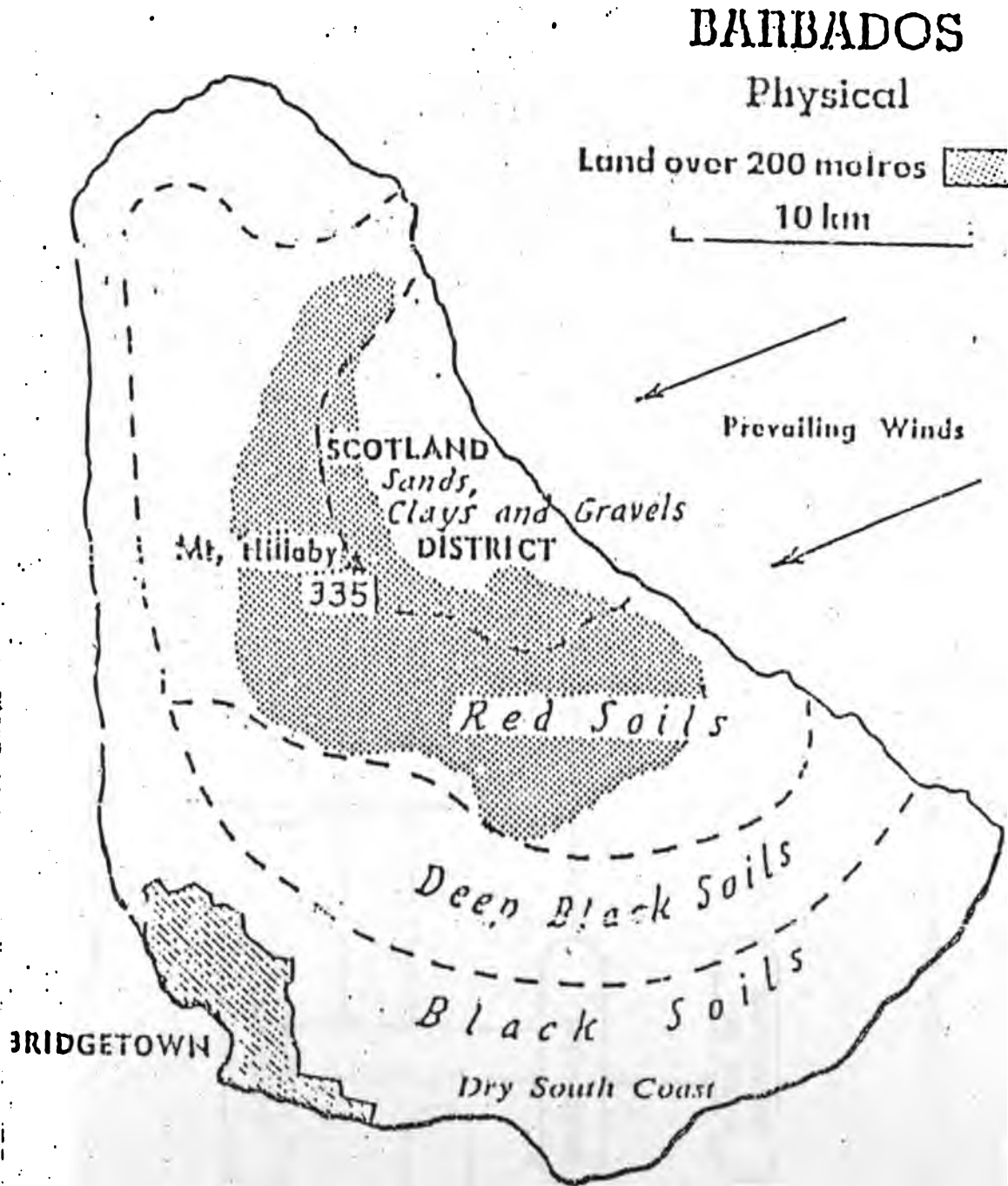
TOPOGRAPHY OF THE ISLAND

Old sea cliffs shown 
Higher cliffs are marked heavily
Ridges and Valleys of Scotland District
are shown very simply



SOURCE: Waterman, Ivan L. Barbados Our Environment

BARBADOS
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FIGURE II-2
SOIL TYPE



SOURCE: Eyre, Alan - A New Geography of the Caribbean



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INTEGRATED LIVESTOCK PROJECT

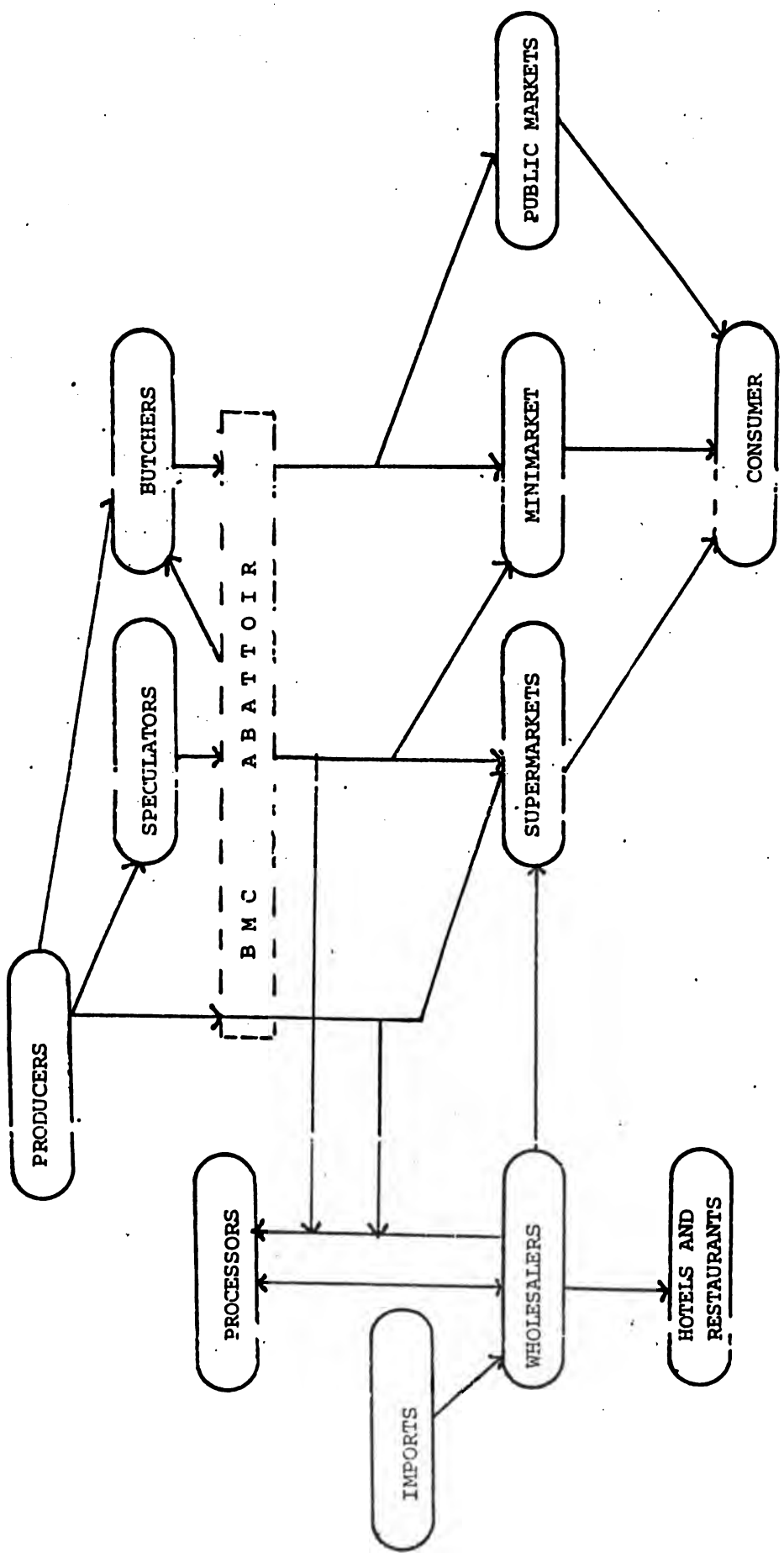


Figure II-4 Marketing Channels for Livestock and Meat, Barbados-1986

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BARBADOS
INTEGRATED LIVESTOCK PROJECT
FIGURE II-5

ORGANIZATIONAL CHART OF THE M.A.N.R.

