The Current State of the Jamaican Cattle Sector

Study Commissioned By
The Jamaica Livestock Association Limited

Jabico Investments Limited
in association with
P. G. Jennings Ph.D, Jamaica Dairy Development Board

The Current State of the Jamaican Cattle Sector

Final Report

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Foreword

With invested capital estimated at $7.5 billion, the beef and dairy sectors are vitally important to Jamaica's economy, contributing $5.3 billion to GDP in 2003 and currently providing employment to approximately 8,000 persons in rural Jamaica. An estimated 13,800 jobs have been lost over the last thirteen years resulting from the decline of the sectors. The cattle sector is also critical to Jamaica's food security and plays an important role in adding nutrients to agricultural lands.

The sectors are facing challenges today that they have never faced previously. Their very survival is being threatened. Globalization and liberalization of markets have been accompanied increasingly with more intensive competition. Our beef and dairy farmers have been forced to compete against heavily subsidized products from OECD states. Here in Jamaica, the sectors have not received the attention and support commensurate with their contribution to national development.

Inherent difficulties have forced many farmers out of business and are sufficiently discouraging potential investors. However, despite all the problems and challenges, the Jamaica Livestock Association (JLA), along with many other stakeholders, have stuck it out and remain firmly committed to the revitalization and expansion of the cattle sector. This is not to attribute any lack of commitment on the part of those who have had to exit the sector.

However, despite all the challenges, the cattle sector has considerable potential. Jamaica's growing tourism sector and the advent of the CSME will expand local and regional markets. In addition, the World Bank is projecting very significant growth in the demand for beef and milk by developed countries from now until 2020. What is more exciting is that the supplies to satisfy the projected demand are expected to come from developing countries. The already heavily intensive industrial farming systems in the developed countries will not be able to absorb the anticipated growth requirements.

Both the government and other stakeholders within the cattle sector must commit themselves to strengthening the sector in the face of its

many challenges and opportunities. The transformation process will require fundamental shifts in the way beef and dairy products are produced, processed and marketed currently. Farmers must be prepared to produce products of international quality and at competitive cost. They should avail themselves of the opportunity to invest at the processing and marketing stages of the value-added chain, through equity investment, joint ventures or any other such instrument.

Though there are no easy solutions, this Report is the first step in the development of a strategic plan of action for the rehabilitation of the cattle sector. For the revitalization program to have any chance of success, it **must have** the cooperation, commitment and active support of the sector's stakeholders. To this end, the commitment of the JLA is assured.

On behalf of the JLA, I wish to thank all those who have contributed to the realization of this Report. The comments of farmers and other stakeholders have been particularly helpful. I also use this opportunity to solicit the cooperation, commitment and participation of all those within the sector as we press towards the next stage of the transformation process. Government's contribution will be especially essential.

H. J. Rainford
Managing Director
The Jamaica Livestock Association Ltd.

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Executive Summary

The continuing decline and the deepening crisis in the beef and dairy cattle sectors prompted leading stakeholders, led by the Jamaica Livestock Association (JLA), to seek government's support in the effort to reverse the negative trends and place the sectors on a path of sustained growth.

Following an initial meeting with the Minister of Agriculture the JLA commissioned a study of Jamaica's cattle demographics to define the current status of the beef and dairy sectors. The study would include a survey of beef and milk producers to obtain current and factual data on the demographics of the beef and dairy cattle sectors, which would clarify, more accurately, the opportunities and constraints facing the sectors. The empirical data obtained would provide information for requisite policy formulation and the resulting strategic approaches that would be necessary particularly in an increasingly competitive global market.

This report analyses the results of a demographic survey of beef producers conducted between May 03-13-2005 and updated data from a similar survey of the dairy sector which was undertaken in early 2004. To complement the farm survey, interviews were also conducted with abattoir operators and other industry players. The analysis of the data obtained has helped to clarify the sector's strengths and weaknesses as well as an assessment of the opportunities and threats faced by the cattle sector.

Overview of Cattle Sector

Contribution of the Cattle Sector to Jamaica's Economy

Annex 7 gives details of the estimated contribution of the local beef and dairy sub-sectors to total GDP.

Estimated direct contribution to GDP in 2003 was $5.38 billion, of which beef and milk contributed 82% and 18% respectively. If the $5.38 billion is adjusted for the estimated 15% contribution to beef production by the dairy sector, the adjusted contributions are J$3.4 billion and J$1.6 billion for the beef and dairy sectors respectively.

Compared to returns at farm gate of $1.27 billion, the direct contribution of the sector to GDP represents a multiplier effect of 3.96.

Currently, the cattle sector is estimated to provide direct employment for 7775 persons, hired labour representing 45.7 percent of total employment, with the annual wage bill estimated at $1.2 – $1.4 billion. The importance of the sector with respect to employment can be best appreciated by the loss of an estimated at 13, 870 direct job as a result of the decimation of the beef and dairy sectors over the past fifteen years.

These estimates omit the linkages of the sector to the feed and fertilizer manufacturing and other input supply sectors. Current feed and fertilizer usage by the Dairy sector is estimated at 0.44 kg per litre and 51 kg N/ha (Jennings 2005), equivalent to an estimated total expenditure of J$108 million in 2004.

Production and Consumption

The production of beef peaked at 18.4 million kilograms in 1992 but with imports quadrupling between 1990 and 1995 fell by 41 percent to 10.75 million kilograms by 2004.

Local production of milk, having peaked at 38.8 million litres in 1992, has fallen consistently, except for a brief rally between 1996-1999, to 18.4 million litres in 2003, declining further to 15.4 million litres in 2004.

The importation of milk powder, the principal substitute for fresh milk, has provided a shock from which the sector is yet to recover. Given the 10:1 replacement ratio of milk powder for fresh milk, the initial influx saw milk powder imports increasing by 2186 metric tons (equivalent to 21.9 million litres).

Structure of the Cattle Sector

The beef sector is, in the main, fragmented with little or no vertical integration from primary production to marketing and distribution. Except for one large and intensive feedlot-based production system integrated with a highly mechanized meat processing operation, the majority of small beef farmers mostly sell their cattle to local butchers for slaughter and sale in local communities. Many of the medium to large farms sell their cattle to traders, who resell same to feedlot operators and/or meat processors.

On the other hand, the advent of the Jamaica Dairy Farmers Federation (JDFF) has provided an opportunity for dairy farmers to become more involved in upstream value-added processing,

thereby earning higher returns. However, the prolonged non-completion of the Milk Marketing Project, as conceptualised, has precluded the JDFF from realizing the benefits of upstream integration. Beef farmers, therefore, should also integrate further upstream, thus increasing their margins by participating in the returns from value-added processing.

Economic Considerations

High operating cost (high interest rates and imported input costs) is a major factor affecting the cattle sector's competitiveness.

The cost of investment capital and high financing rates, coupled with the high risk and comparatively low returns on beef and dairy production render the sectors relatively unattractive to investors and traditional financial institutions.

The result is that existing farmers, within the sector, are unable to source adequate financing for rehabilitation or to capitalize on market opportunities.

Government Policy Interventions

Government's policy interventions, at best, have been ineffective in providing a cushion in the face of massively subsidized imports. Both the local beef and dairy farming sectors have shown sustained adverse response to the trade liberalization policy adopted by the Government of Jamaica in 1992 as a condition of its agreements with the World Bank and the IDB in respect of successive structural adjustment loans.

An adverse consequence of these loan agreements was the sky rocketing of interest rates on farm loans in 1992 –1993, which effectively precluded beef and dairy producers from access to developmental financing which would have been necessary to place the sectors in a competitive position in a newly 'liberalized' market place marked by continuingly high levels of producer support to agriculture in the OECD member states.

As in the case of beef, the reduction in the effective tariff levels has proven injurious to the dairy sector. The removal of the price equating cess formerly administered by the Jamaica Commodity Trading Company and its replacement with the 30% Common External Tariff exposed the vulnerability of the local milk producing sector.

Another adverse consequence of the series of structural adjustment programs was significant reduction in real expenditure on livestock R&D. Services such as artificial insemination and other sire service schemes, milk recording, and progeny testing, have been either discontinued or curtailed drastically.

Technology

Both the beef and dairy sectors have made only marginal use of the available wealth of research data and technology, in their operations.

Social/Cultural Trends

Over the past several years, there has been a trend away from the consumption of red meat, primarily beef, and dairy products, especially fluid milk. In recent years, however, in keeping with global trends, local beef consumption has been increasing. There are also significant increases in the consumption of value-added dairy products such as ice cream, cheese, and yogurt.

There is, therefore, an urgent need to develop appropriate strategies and policies for the sustainable recovery of both the dairy and beef sectors to seize the prevailing and projected growth opportunities.

Survey Objectives & Scope

The objectives of the survey were to:

A. Obtain qualitative and quantitative information regarding Jamaica's cattle demographics and the key constraints facing the beef and dairy sectors.

B. Determine the disposition of stakeholders of the beef and dairy industries to the future of their respective sectors.

C. Use the findings of the survey to:

   i) Determine the potential opportunities and threats facing the sectors and identifying main points of leverage for maximizing the former and minimizing the latter.

   ii) Assess the current and future demand for beef and milk vis-à-vis current inventories of cattle.

   iii) Define the existing slaughter capacity and market profile for beef in order to establish if there is a need for a HACCP certified abattoir and processing facility.

The survey canvassed:

- All Breed Society members
- All large commercial producers (> 99 cows)
- A random sampling within each parish of small and medium-scale farmers (1-99 cows)

Major Findings of Survey

The major findings of the survey are summarized in the Table below.

	BEEF	DAIRY
No of farmers	3964	245
Distribution by size class	Small (0.85) Medium (0.13) Large (0.02)	Small (0.73) Medium (0.15) Large (0.12)
Total Pasture land (ha)	26800	7225
Percentage in improved grasses	49	89
No. of employees	3002	539
Estimated Job Losses (1990 – 2005)	12,680	1,190
Cattle population	66500	17300
Percent Purebred Cattle	14.4 (JR 70.6% of purebred)	85.5 Jamaica Hope
Total Breeding Herd	34615	10690
Stocking Rate (au/ha)	1.29	1.48
Installed processing capacity	76900 head	80M litres
Throughput 2004	52379	15.4M litres
Projected throughput 2005	37000	15.9M litres
Projected throughput 2014	111630	50.4M litres
Valuation on land ($/ha)	$70,000	$125,000
Value of assets employed	$7.5B	$2.3B (2004 -$1.8B)
Total output 2004	9.1 (kgM)	15.4M litres milk 1.6 (kg M beef)
Output/hectare	339.5 kg	4032 litres 221 kg beef
Value of output at current prices	$728M	$498M
Gross returns on asset employed (%)	9.7	21.7
Contribution to GDP 2003	$3.4 billion	$1.6 billion
Main technical limitation	Pasture management	Pasture management
Main strategy for increasing market share	Upstream integration through central abattoir	Upstream integration through JDFF
Perceived role of Government	a) Reduced interest rate on farm loans b) Increased tariffs on imports c) Concession on import duties & GCT on imports for cattle sector	a) Reduced interest rate on farm loans b) R&D

Issues Relating to Succession Planning

A major issue that the survey instrument was not designed to capture was data regarding the age of beef and dairy farmers and its significance to the issue of succession planning.

The canvassers and consultants, in their interviews with several prominent farmers, observed that an estimated 90% to 95% of beef and dairy farmers were well advanced in age. In fact, many expressed grave concerns re the continuity of the sector.

Changing social lifestyles, the relatively high capital investment required for entry and the low returns on investment in beef and dairy farming, and the misconceived notion that large scale cattle farming is a pastime of the rich, are some factors which may be attributed to the unattractiveness of the cattle sector to young people.

It would be interesting and instructive to determine how much of the attrition that has occurred over the past fifteen years is the result of children turning their backs on the beef and/or dairy farms which their parents would have wished to pass on to them.

Major Issues Raised by the Survey Findings

The major and most pressing issues that have surfaced from the survey are:

a) The attrition in the beef and dairy sectors since 1990

b) The prevailing low levels of efficiency, resulting in marginal returns on investment

c) Inadequate use of available technology

d) The high cost of financing

e) The unattractiveness of the sectors to young persons especially in view of the advanced ages of most of the present owners

f) The fragmented structure of the sectors does not allow for the benefits that can be achieved through cooperation and network alliances

Conclusions and Recommendations

The marked attrition in the beef and dairy sectors since 1990, poses a grave threat to their survival. The obliteration of those sectors would have very serious consequential economic, social, and political implications.

With total investment estimated at $9.8 billion and contribution to GDP (2003) at $5.3 billion, the sectors remain significant components of the national economy in general but the rural economy in particular. Their collapse, therefore, would have severely negative economic and social impact nationally.

On the basis of the findings, the following recommendations are being proposed:

1. As a matter of urgency, the key stakeholders within the beef and dairy sectors should be apprised of the findings of this study and their input, cooperation, and commitment sought in the development of a national plan for the comprehensive rehabilitation of the cattle sector.

2. The revitalization program, though soliciting Government's support and facilitation, should be private-sector-led. Government's role should be that of facilitator and enabler and confined primarily to the following:

    a) The creation of a fiscal policy environment, which would provide, over the medium term, a cushion against heavily subsidized imports as well as concessions on duties and General Consumption Tax on imported inputs.

b) Ensuring the sustained generation of cost-effective appropriate technology for beef and milk and value added production by enabling the R&D arm of the Ministry of Agriculture and the Scientific Research Council.

c) Raising the competency level of farmers and farm employees through RADA, HEART/NTA and other educational institutions.

3. The Jamaica Livestock Association, given its stable position at the core of the livestock industry for more than sixty years, is placed uniquely to spearhead the development of the rehabilitation programme and administering its implementation.

4. The rehabilitation programme should focus on:

a) Increasing the level of productivity on beef and dairy farms by the application of greater levels of technology

b) Reducing the cost of production to the sector through reduced tariffs on imported inputs

c) Increasing the proportion of improved grasses on beef cattle farms from the present 49% to 80% and on dairy farms from 89% to 95%, within 5-8 years

d) Implementing, through private sector initiative, a comprehensive and effective programme of animal evaluation, which is a prerequisite for capitalizing on the projected increase in global demand for tropical animal genetics

e) Facilitating the availability of low cost capital with extended payment periods to the sectors to facilitate the requisite development initiatives

f) Developing programs and strategies to make the sectors more attractive to young persons in general but to more females in particular

g) Facilitating greater levels of cooperation among members of the beef and dairy sectors, through the promotion of network collaboration

h) Establishing, as a matter of priority, a centrally located and certified abattoir and meat processing facility, allowing beef farmers the option of investing equity in its capitalization

5. A proposal should be developed and submitted to Government for the restructure and/or divestment of the milk-marketing project of the Jamaica Dairy Farmers Federation to ensure equity participation by farmers and effective management.

1.0 INTRODUCTION

1.1. Background

The continuing decline and the present and deepening crisis in the beef and dairy cattle sectors prompted leading stakeholders, led by the Jamaica Livestock Association (JLA), to meet with the Minister of Agriculture, to seek government's support in the effort to reverse the negative trends and put the sectors on a path of sustained growth.

Following an initial meeting with the Minister of Agriculture the JLA, commissioned a survey of Jamaica's cattle demographics together with a report on the current status of the beef and dairy sectors. The empirical data derived from the survey would provide the basis to inform the requisite policy formulation and the resulting strategic approaches that would be necessary.

The JLA retained the services of Jabico Investments Limited (JABICO) to conduct the survey and prepare this report. JABICO enlisted the collaboration of Dr. Paul Jennings, Chief Executive Officer of the Jamaica Dairy Development Board (JDDB), and received assistance from the Data Bank and Evaluation Division of the Ministry of Agriculture (MOA) in the design of the survey instrument and collation of the survey results. Technical personnel from the JDDB and the R&D Division of the MOA conducted the survey.

1.2. Purpose of the Study

The purpose of the study is to provide current and factual data on the demographics of the beef and dairy cattle sectors, which will clarify, more accurately, the opportunities and constraints facing the sectors.

The analyzed results of the survey will provide the basis for a more informed representation to government for policy shifts and, in addition, will provide beef and milk producers with more current and accurate information upon which to make critical decisions in an increasingly competitive global market.

1.3. Scope

This report contains the results of a demographic survey of beef producers and updated data on a similar survey of the dairy sector which was undertaken in early 2004. The update is required because the passage of hurricane Ivan in September 2004 reportedly influenced the liquidation of several medium sized herds.

The survey provides data on the size, scope, structure and other relevant parameters of the local cattle sector. Analysis of the data obtained from the survey and the informed observations of a wide range of stakeholders and sector observers have helped to clarify the sector's strengths and weaknesses and the opportunities and threats.

1.4. Organization of the Report

This report contains the following sections:

Section 1: provides background information about the genesis of this report.

Section 2: gives an overview of the current factors (internal and external) impinging on the beef and dairy sectors.

Section 3: outlines the objectives and methodology of the research survey.

Section 4: contains the results of the survey and the analysis of the data.

Section 5: covers the strengths, weaknesses, opportunities, threats, and constraints.

Section 6: contains a summary of the major findings, concluding remarks and recommendations.

2.0 OVERVIEW OF THE BEEF & DAIRY SECTORS

2.1. The Beef Sector

The beef sector is experiencing the best of times and the worst of times. While current demand for beef is very strong and prices favourable, supply is weak as a result of the steady decimation of the national breeding herd over the last twelve years. The current estimated herd size of 66,500 is 54% less than the 144,750 recorded in the Livestock Census of 1990.

Peak production of beef (18.21 million kilograms) was attained in 1992 but with imports quadrupling between 1990 and 1995, production of beef declined by 41 percent by 2004, when only 10.75 million kilograms were produced locally. Thus, local production, having accounted for 82.9 percent of consumption in 1990, fell to 56.6 percent by 2000.

With respect to extraction, the number of cattle slaughtered annually reached a decade high of 85,248 in 1993, falling to 52,379 in 2004 (*Data Bank & Evaluation Division 2001; 2005*).

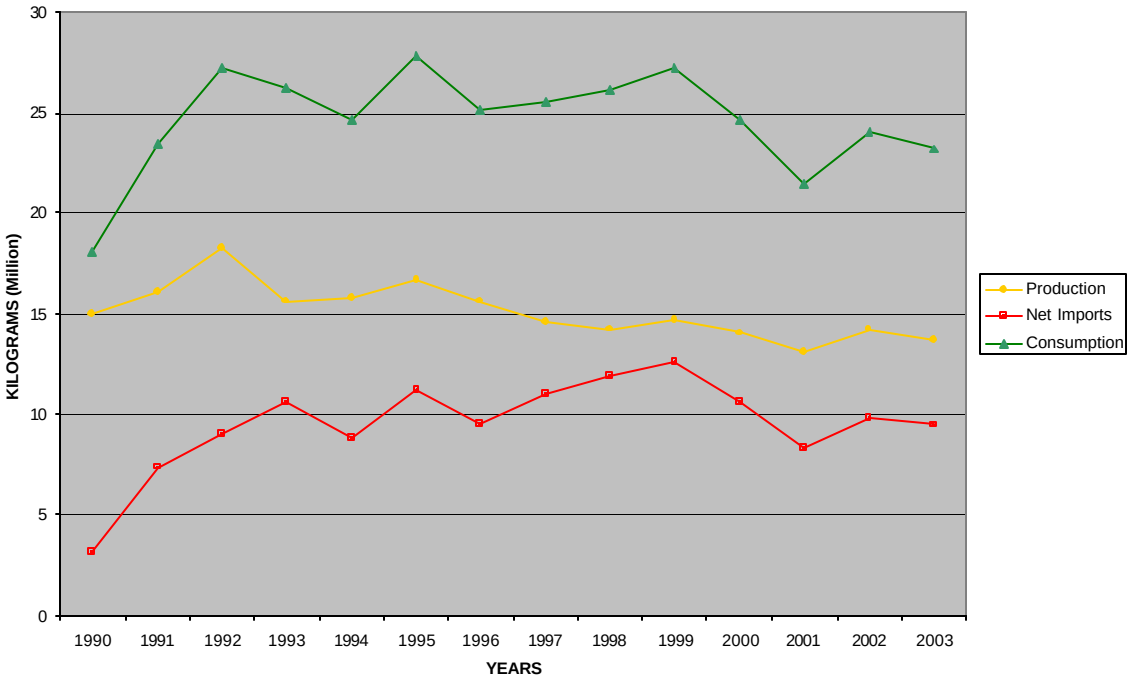
Per capita consumption of beef increased 25 percent during the five-year period to 2003 compared to the period 1986-1990 but the increase was entirely driven by increases in beef imports which correspondingly grew by 150 percent.

Table 1 (overleaf) provides data on the production, imports and consumption of beef for the period 1986 – 2004, with the figures for 1986 through 1990 aggregated. Figure 1 depicts the data for the period 1991-2004 graphically.

TABLE 1: Components of National Beef Consumption (1986-2004)

Year	No. Cattle Slaughtered	Production (kg M)	Ave. Carcass Wt (kg)	Imports (kg M)	Consumption	
					Total (kg M)	Kg per Capita
1986-1990	**65903**	**14.11**	**214.1**	**4.19**	**18.30**	**7.38**
1991	75652	16.05	212.2	7.40	23.45	9.30
1992	80007	18.21	227.6	9.06	27.27	10.7
1993	85248	15.64	183.5	10.65	26.29	10.3
1994	72717	15.79	217.1	8.86	24.65	9.67
1995	71294	16.65	233.5	11.21	27.86	10.88
1996	68789	15.64	227.4	9.54	25.18	9.80
1997	64064	14.54	227.0	11.00	25.54	9.90
1998	63321	14.25	225.0	11.88	26.13	10.09
1999	61406	14.69	239.2	12.62	27.31	10.42
2000	60302	14.04	232.8	10.76	24.80	9.46
2001	60461	13.10	216.7	8.58	21.68	8.21
2002	63520	14.26	224.5	10.16	24.42	9.25
2003	66532	13.71	206.1	9.82	23.53	8.90
2004	52379	10.75	205.2	n/a	n/a	n/a

FIGURE 1: Beef Production, Imports & Consumption



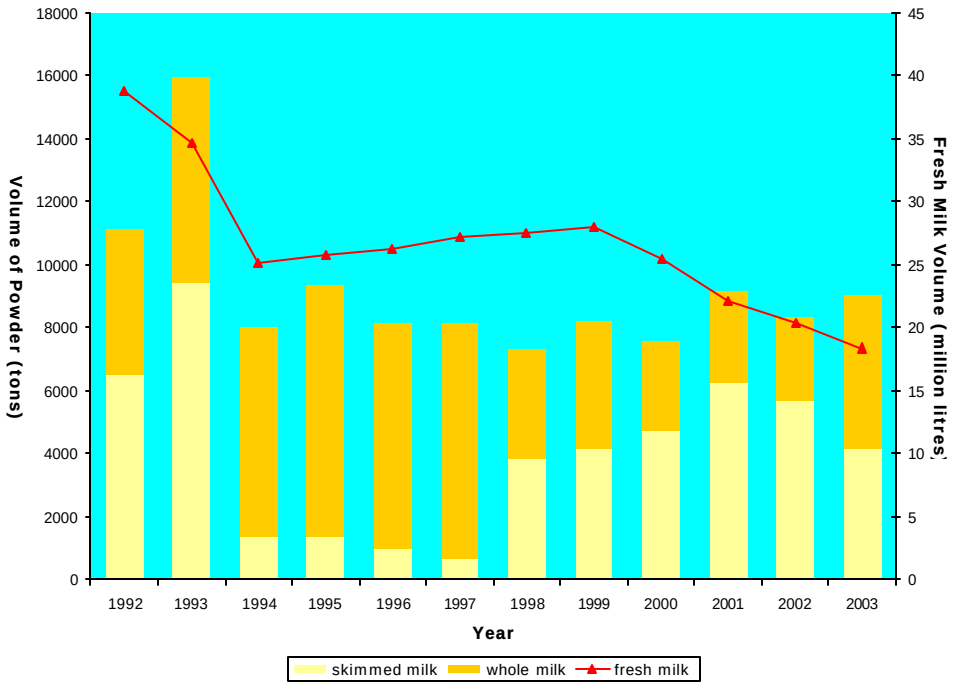
The reduction in the effective tariff levels has proven injurious to the local beef sector. The agreement with the World Bank required that the aggregate tariff levels, as high as 150 percent on some cuts in 1991, be scaled back to the CET level within 5 years. However, the Jamaican Government has retained an aggregate level above the CET rate. The current duty level of 86 percent on most cuts, has provided little protection to local beef producers, resulting in significant reduction in the demand for local beef and subsequent sharp declines in the price offered to farmers.

The incidence of 'Mad-Cow' disease in the USA, the major source of our beef imports, in 2003, has provided an apparent lifeline to beef producers resulting in very favourable prices being offered since. However, the apparent decimation of breeding herds, which accompanied the earlier declines indicates that this lifeline might in fact be very transient.

2.2. The Dairy Sector

Figure 2 shows the trends in fresh milk production and the imports of milk solids for the period 1992-2003.

FIGURE 2: Trends in Fresh Milk Production and Milk Powder Imports 1992 - 2003



Source: Jamaica Dairy Development Board

Local production of milk, having peaked at 38.8 million litres in 1992, has fallen consistently, except for a brief rally between 1996-1999, to 18.4 million litres in 2003, declining further to 15.4 million litres in 2004. The decline in 2004 can be attributed, in part, to the passage of Hurricane Ivan in September of that year.

The trend in imports of milk powder, the principal substitute for fresh milk, has not been as distinct as with beef. However,

given the 10:1 replacement ratio of milk powder for fresh milk, the initial influx which saw milk powder imports increasing by 2186 metric tons (equivalent to 21.9 million litres), was to provide a shock from which the industry is yet to recover. In contrast to beef, per capita consumption of milk and dairy products has stagnated, largely due to the relative unaffordability of these products and the failure to diversify product range in keeping with shifting consumer patterns (*Jennings 2005*).

Imports of ice cream and yoghurt have grown exponentially since 1996 while cheese imports have shown an underlying lower rate of increase with significant annual fluctuation. These support the assessment that consumption patterns having shifted away from consumption of fresh milk, the industry should pursue diversification of its product range, vigorously, to stimulate increased demand (manufacturing) for liquid milk.

As in the case of beef, the reduction in the effective tariff levels has proven injurious to the dairy sector. The removal of the price equating cess formerly administered by the Jamaica Commodity Trading Company and its replacement with the 30% Common External Tariff exposed the vulnerability of the local milk producing sector.

The sections following highlight some of the broad factors responsible for the current status of the beef and dairy sectors.

2.3. Sector Structure

Two distinct segments define the production, processing and marketing of beef. On the one hand, there is the large and intensive feedlot-based production system integrated with highly mechanized meat processing operation, supplying prime cuts to the hotel sector and supermarkets and lesser cuts to fast food chains. On the other hand, many small farmers, some using public lands for their few head of cattle to graze, either sell their cattle to local butchers for slaughter and sale in local communities or they pay to have them slaughtered and then they sell the meat themselves. There are also traders, persons who select and buy cattle, which they resell to meat processors.

In the main, the beef sector is fragmented with little or no vertical integration from primary production to marketing and distribution. The almost total reliance of farmers on others for the processing and marketing of their produce often places them in a disadvantageous bargaining position, with the traders, processors, and distributors getting the bulk of the margin gained in the chain between production and retail. In addition, and very importantly, beef producers, not in close contact with the final consumer, may be slow in reacting to market signals.

The advent of the Jamaica Dairy Farmers Federation has provided an opportunity for dairy farmers to become more involved in upstream value-added processing, thereby earning higher returns. However, the prolonged non-completion of the Milk Marketing Project, as conceptualised, has precluded the JDFF from realizing the benefits of upstream integration. Beef farmers, therefore,

should also integrate further upstream, thus increasing their margins by participating in the returns from value-added processing.

2.4. Economic Factors

The high cost of financing and other input costs coupled with the high risk and comparatively and relatively low returns on beef and dairy production makes the sectors relatively unattractive to investors and traditional financial institutions. The result is that existing farmers within the sector are unable to source financing for rehabilitation or to capitalize on market opportunities.

It is not difficult to see the eventual outcome of any institution whose marginal returns are inadequate to fund its development or resuscitation and, at the same time, is unable to attract external financing to do so. At best, such an institution will stutter on to a slow but eventual death.

A sector is in very serious trouble when many of its prominent players are dropping out and no new ones are replacing them.

2.5. Political Considerations

Government's policy interventions, at best, have been ineffective in providing a cushion in the face of massively subsidized imports. Both the local beef and dairy farming sectors have shown sustained adverse response to the trade liberalization policy adopted by the Government of Jamaica in 1992 as a

condition of its agreements with the World Bank and the IDB in respect of successive structural adjustment loans. A particularly adverse consequence of these loan agreements was the sky rocketing of interest rates on farm loans to as high as 42% in 1992 –1993. This effectively precluded beef and dairy producers from access to developmental financing which would have been necessary to place the sectors in a competitive position in a newly 'liberalized' market place marked by continuingly high levels of producer support to agriculture in the OECD member states.

Another adverse consequence of the series of structural adjustment programs was significant reduction in real expenditure on livestock R&D. Services such as artificial insemination and other sire service schemes, milk recording, and progeny testing, have been either discontinued or curtailed drastically.

Leaders in the beef and dairy sectors must come to the realization that political intervention or non-intervention is a major and very critical factor of success. Political actions, therefore, must be managed and not allowed to be loose cannons. Other sectors/industries/businesses engage in constant and intense lobbying. The beef and dairy sectors need to strengthen their lobbying arms.

2.6. Technological Considerations

It has become widely acceptable that knowledge is the most important resource to businesses. Both the beef and dairy sectors have made only marginal use of the available wealth of research data and technology in their operations. For example, dairy farmers, for the most part, continue to rely very heavily on imported concentrates, indifferent to the well-documented benefits of well-managed pastures.

2.7. Social/Cultural Trends

Over the past several years, there has been a trend away from the consumption of red meat, primarily beef, and dairy products, especially fluid milk. In recent years, however, in keeping with global trends, local beef consumption has been increasing, thanks to the fast food industry and the growing popularity of the 'Atkins diet' (Text Box 1). There are also significant increases in the consumption of value-added dairy products such as ice cream, cheese, and yogurt.

For the most part, many industries/sectors/businesses allow themselves to be victims of trends, which are often orchestrated. The campaign against coconut oil and milk, a few years ago, was more lethal than any disease the coconut industry has experienced. Reaction time and the associated cost being indeterminable, it is very difficult to determine the real potential of unmanaged trends. Like political actions, trends can and must be managed.

Industries that manage trends well are those that have in place means of constantly policing the market place, recording data analysing information, and effectively lobbying policy makers and opinion leaders.

There is, therefore, an urgent need to develop appropriate strategies and policies for the sustainable recovery of both the dairy and beef sectors. This would need to be based on factual data on the size, scope, structure and other relevant parameters of the local cattle industry.

TEXT BOX 1: The Atkins Diet Promotes Beef

Steak with Bearnaise sauce, eggs, and bacon; cheddar cheese omelets -- don't hold the yolks; Roquefort dressing and silky smooth avocado cream soup made with real cream? These rich foods are allowed as part of the controversial diet described in Dr. Atkins' New Diet Revolution, a phenomenal best seller, and several follow-up books.

The Atkins diet promises that not only will you lose weight -- and not be hungry -- with a low-carbohydrate diet, but you'll also be on the road to better heart health and memory function, as well as other wellness benefits.

The diet is based on the theory that overweight people eat too many carbohydrates. Our bodies burn both fat and carbohydrates for energy, but carbs are used first. By drastically reducing carbs and eating more protein and fat, our bodies naturally lose weight by burning stored body fat more efficiently.

While the American Cancer Society recommends the limited consumption of red meats, especially those high in fat and processed, for optimal cancer prevention, the Atkins plan places no limit on the amount of protein, fats and red meats one can consume.

Source: ***www.mywebmd.com***

3.0 SURVEY OBJECTIVES AND METHODOLOGY

This section highlights the work undertaken to gather the information necessary to assist the process of conducting the analysis.

3.1. Survey Objectives

The objectives of the survey were to:

A. Obtain qualitative and quantitative information regarding Jamaica's cattle demographics and the key constraints facing the beef and dairy sectors.

B. Determine the disposition of stakeholders of the beef and dairy industries to the future of their respective sectors.

C. Use the findings of the survey to:

   i) Determine the potential opportunities and threats facing the sectors and identifying main points of leverage for maximizing the former and minimizing the latter.

   ii) Assess the current and future demand for beef and milk vis-à-vis current inventories of cattle.

   iii) Define the existing slaughter capacity and market profile for beef in order to establish if there is a need for a HACCP certified abattoir and processing facility.

3.2. Research Methodology

The methods, outlined in the sections following immediately, were used to collect the requisite data to meet the study's objectives.

3.2.1. Primary Data

Primary data was obtained using the following approaches:

- Conduct of an island wide survey (see copy of survey instrument at Annex 1)
- Face to face and telephone interviews with beef and milk producers and processors and other key stakeholders in the industry
- The 2004 survey of dairy farms conducted by the Jamaica Dairy Development Board
- Statistical reports from the Statistical Institute of Jamaica (STATIN)
- Publications and documentations from the Jamaica Dairy Development Board
- Data Bank and Evaluation Division of the Ministry of Agriculture
- Observation on visits to beef and dairy farms
- A meat market study commissioned by the Agriculture Support Services Project in the Ministry of Agriculture

3.2.2. Size and Scope of Survey of Beef Farmers

The survey canvassed:

- All Breed Society members
- All large commercial producers (> 99 cows)
- A random sampling within each parish of small and medium-scale farmers (1-99 cows)

TABLE 2 gives a breakdown by parish, size, and class, of the farms surveyed.

Table 2: Distribution of Farms Surveyed

Parish	Size Class				Total
	Sm.	Med.	Large		
			Breed Society	Commercial	
St. Thomas	-	-	1	-	1
Portland	-	-	1	-	1
St. Mary	-	4	1	1	6
St. Ann	-	1	12	5	18
Trelawny	2	2	4	-	8
St. James	-	-	1	-	1
Hanover	1	6	2	7	16
Westmoreland	1	4	4	4	13
St. Elizabeth	4	13	9	3	29
Manchester	1	-	2	-	3
Clarendon	10	4	1	-	15
St. Catherine	7	6	2	2	17
All Island	**26**	**40**	**40**	**22**	**128**

3.2.3. Research Survey

Survey Design

Following consultation with members of the Board of Directors of the JLA, a survey instrument was designed to capture:

i) Information from all Breed Society members currently engaged in beef production.
ii) Information from all other large commercial beef producers.
iii) A representative island-wide sample of small and medium-sized beef producers.

For convenience and consistency with the 2004 Dairy Farms Survey, beef farms were classified by farm size into:

Small - <10 acres
Medium - 10-99 acres
Large - >99 acres

Consultations with Mrs. Jasmin Holness, Deputy Director-Livestock, Ministry of Agriculture, Mr. Charlie Harris, Life Member of Breed Societies, Dr. Karl Wellington, Chairman Jamaica Red Poll Cattle Breeders Society and Mr. Edwin Gayle, Chairman Jamaica Black Cattle Breeder Society, allowed for the development of a list of all current breeders of Jamaican purebred beef cattle as well as all large commercial breeders. These consultations also provided

useful information on medium and small commercial breeders which was supplemented by consultation with the Management and staff of the RADA parish offices.

The island wide field survey was conducted during the two-week period 03-16 May 2005 by a team comprising six (6) experienced members of staff of the Ministry of Agriculture R & D Division and the Jamaica Dairy Development Board. Annex 2 lists members of the survey team and their assigned areas of coverage. Annex 3 lists all the farmers surveyed.

In addition, a number of farmers were canvassed by way of telephone interviews or by copies of the questionnaire transmitted and returned by fax or e-mail. In the case of one significant (but reluctant) pure breeder, resort was made to third party interviews with persons knowledgeable of the particular farming operation to establish a reliable profile of this particular herd.

Collection of the completed questionnaires was extended to a third week to enable returns from producers who were unable to meet the initial two-week deadline.

Five large (commercial) beef operations failed to return questionnaires or refused their cooperation (one). Table 3 lists non-respondent operations with an estimate of the size of their individual breeding herds.

Table 3: Non-respondent Large Operations

Farms	Location of Farm	Estimated Herd Size
Farm # 1	Manchester	350
Farm # 2	Manchester	400
Farm # 3	St. Catherine	250
Farm # 4	St. Mary	400
Farm # 5	St. Mary	150
Estimated Total Missed		**1,550**

Interviews with Feedlot and Abattoir Operators.

Interviews were conducted with 8 persons (or corporate entities) engaged in the operation of abattoirs and distribution of locally produced beef. Among these, four were also engaged in feedlot fattening as part of vertically integrated business operations.

In addition, two stand-alone feedlot operators and one farmer engaged exclusively in grass finishing were also interviewed during the course of our canvassing.

Key Stakeholders Interviewed From the Beef and Dairy Farm Sectors

Annex 4 lists the key stakeholders interviewed from among the primary producers of milk and beef.

4.0 SURVEY RESULTS & ANALYSIS

4.1. Survey of Beef Producers

Appendices 1-42 summarise the primary data collected from participants in the survey. The distribution between parishes and size classes, of the farms surveyed is shown in Table 2.

The data with respect to the number of farmers canvassed, herd sizes, area in pastures, herd composition and effective stocking rates are summarized for the three size classes in Table 4 (overleaf).

A total of 128 farmers returned survey questionnaires at varying stages of completion. In relation to the qualitative data, ten (10) respondents provided no responses to questions 12-18 which sought their perspectives on the sector.

With respect to these questions, it was originally intended for respondents to select the single response from among the four options which best reflected their own perspective. However, a number of respondents felt strongly enough about two or more of the options offered in some questions. Hence, the total number of responses, in the case of several questions, exceeded the overall total number of farmers canvassed. This however, reflects the multi-faceted nature of the problems faced by the sector and provides for a clearer understanding of the farmers' perspective.

Table 4: Summary of Results of Survey: Herd and Farm Sizes

	Small	Medium	Large		Total
			Breed Soc.	Commercial	
No. Farms	**26**	**40**	**40**	**22**	**128**
Acres Occupied	90.1	1541	44395	15505	61531
Acres in Pasture	86.1	1331.5	25644	9760	36731.6
Cows	447	682	6127	3089	10345
Bulls	18	37	437	225	717
Steers	0	175	173	115	463
Heifers	90	297	2088	1224	3699
Young Bulls	85	189	347	1208	1829
Heifer Calves	59	130	1982	623	2749
Bull Calves	38	130	1622	560	2350
Total Herd	737	1640	12776	7044	22197
Estd. Breeding Herd	**477**	**771**	**6823**	**3497**	**11568**
Mean Herd Size/Farm	**28**	**41**	**319**	**320**	**173**
Mean Size of Breeding Herd	**18.4**	**19,3**	**170**	**170**	**166**
Stocking Rate (A.U/ha)	**16.8**	**2.12**	**0.81**	**0.94**	**1.03**

4.2. Demographics Of The National Beef Herd

Following are the main findings in respect of demographics of the national beef herd:

i) The current population of beef cattle is estimated at 66,500 head of which breeding females account for 52 percent or 34,615

ii) Total area of pasture land currently allocated to primary production of beef is estimated at 26,800 hectares, 49 percent of pastures being established in improved grasses. Based on corresponding size of the breeding herd, the mean stocking rate in the national herd is approximately 1.3 animal units per hectare or approximately 1.9 acres per breeding female.

iii) Jamaican purebred cattle breeds accounted for 14.4 percent (9,558) of the total population of beef cattle and 15.4percent of the national breeding herd.

iv) Cross-bred and/or females of other breed types accounted for 14.8 percent of the breeding herds on farms operated by Breed Society members.

v) Large farms (> 99 ac) accounted for 32.2 percent of the beef herd and 57.6 percent of total pasture land. Corresponding proportions of the national herd and pasture land accounted for by medium and small farms were 27.1/25.9 and 40.7/16.4 respectively.

4.3. Demographics Of The National Dairy Herd

The findings in respect of the demographics of the national dairy herd are listed hereunder:

i) The national dairy herd is estimated at a current population of 17,300 head. The breeding herd (10,690) accounts for 61.8 percent of the total population.

ii) Registered Jamaica Hope females or females of similar ancestry account for 85.5 percent of the population of breeding females

iii) The area of farmland allocated to dairying was projected in 2004 at 7375 hectares (73.5% in improved pasture). Given the reported liquidation of 8-10 herds in Clarendon and St. Elizabeth, the 2005 estimate of total farmland in dairying has been adjusted downward to 7225 hectares.

iv) Total number of dairy herds, estimated at 254 in 2004, has been adjusted to 245 for 2005.

v) The relative proportion of herds, land area and breeding females distributed between small, medium, and large farms from the 2004 survey were 72.8%, 15.4% and 11.8% (herds); 7.9%, 9.1% and 83.1% (land area) and 13.3%, 18.3%, and 68.3% (breeding females)

4.4. Update of 2004 Dairy Farm Survey

Table 5 summarizes the salient features of the dairy farm sector as gleaned from the 2004 survey. With respect to population size, the survey estimates the dairy herd at 18,511 of which the effective breeding herd represented 61.8 percent.

Table 5: Profile of National Dairy Herd – 2004

	Small	Medium	Large	Total
No. Farms	185	39	30	254
Total Herd	2749	3192	12570	18511
Breeding Herd:				
Cows	1400	1905	6758	10063
Heifers	127	189	1061	1377
Total	***1527***	***2094***	***7819***	***11440***
Area in Farms (ha)	584	661	6130	7375
Area in Pasture (ha)	576	588	4395	5559
Mean Stocking Rate (au/ha)	**3.1**	**3.8**	**1.9**	**2.1**

Dairy farms were projected to occupy a total of 7,375 ha (18,216 ac) of land, approximately 73.5 percent comprising cultivated pasture.

The passage of hurricane Ivan in September had, perhaps, its harshest effects among dairy farms, on the medium sized farms of the Mid-Clarendon area. The Rhymesfield group reported having been without electricity and potable water for 6-8 weeks after the passage of Ivan. This triggered the liquidation of no

less than 9 herds, with an estimated adult cow population of 458 cows, which had occupied 154 ha (380 acres) of cultivated pastureland. Consultation with key players in the St. Elizabeth Cooperative indicated that the milking population has lost a further 110 cows since June 2004, when the survey was conducted.

As a result, the current dairy cow population has been adjusted downward to 9,460 and the overall size of the dairy-breeding herd to 10,700 from the original estimate of 11,440.

The survey had indicated that the population of dairy breeding females comprised 85.5 percent Jamaica Hope. This suggests that the current gene pool of Jamaica Hope and females of similar ancestry comprises approximately 9,150.

4.5. Estimated Attrition Rates in Dairy and Beef Sectors since 1990

In order to estimate, with any degree of precision, the current population of beef cattle and the number of herds, it was necessary to attempt an estimate of the level of attrition which the Sector has undergone over the past 12-15 years.

Slaughter data from the Data Bank indicate that the number of head of cattle slaughtered annually, fell 38.5 percent between 1993 and 2004 (Table 1). Our interviews with abattoir operators indicate that, currently, their demand for cattle outstrips supply by as much as 50 percent in some cases. This fall in extraction

rates corroborates anecdotal evidence of a severe reduction, over the past decade, in the population of beef cattle.

Data from the Ministry of Agriculture Livestock Census of 1990; the Agricultural Census 1996 (STATIN) and the 2004 Dairy Farms Survey (JDDB), provide some indication of the level of attrition in the dairy sector which it is felt, is closely paralleled by the trends for beef cattle. The 1996 Census suggests an expansion in the size of the beef and dairy breeding herds; inconsistent with the recorded reduced outputs from both sectors. This therefore puts in doubt, its reliability as a reference point.

The consultants, therefore, consider the Livestock Census of 1990 a more appropriate baseline against which to assess recent demographic trends. The Jamaica Dairy Development Board Survey of 2004 (Jennings *et al*, 2004) indicated that with respect to milk producers, the number supplying the formal market had fallen since 1990 by 66 percent. The liquidation of dairy herds over the past 12 months would have increased this attrition rate, however, to 70 percent (224 vs. 753). Within size classes, the 2004:1990 attrition rates were 69, 64 and 3 percent with respect to small, medium and large milk producers. With respect to size of the dairy-breeding herd, the indications are that numbers declined by 21 percent.

With respect to the scale-back within the beef sector, information confirmed with Mr. C. M. Harris (Table 6) identified among large farms, 12 herds (11 pure breeders) which had

exited the industry, a loss of approximately 6,100 cows. Among current pure breeders, we were able to identify 9 herds, which cumulatively have undergone a reduction in their breeding population, of approximately 6,250 cows. Additional information provided by key stakeholders suggests that the above estimates of herd reduction may be understated by as much as 40 – 50 percent.

These, together, suggest that more than twice the current cow numbers in the beef population have been lost to the sector over the past decade. Alternatively stated, the approximately 12,500 cows lost to the national beef-breeding herd would have converted to a total breeding herd of 13,750. On farms with more than 100 head the 1990 census enumerated a total herd of 46,548 animals. Applying current, typical herd composition data, which shows the breeding herd accounting for 52 percent of total herd, suggests that the loss of 12,500 cows would have coincided with the removal of 26,450 animals or 57 percent of the cattle population counted on large farms in 1990.

Table 6: Breeding Herds Lost or Substantially Reduced Since 1990

Name of Farm	Parish	Beef Breed(s)	Est. Breeding Herd Pre-1990
Herds Lost			
Wales	Trelawny	Ja. Brah /Ja. Red	650
Braco	"	Ja.Brah /Ja. Black	400
Long Pond	"	Ja. Brah /Ja. Black	800
Springvale	"	Ja. Brah	400
Good Hope	"	Ja. Brah /Ja. Red	200
3-C's	St. Ann	Commercial	1400
Noel Lawrence	"	Ja. Red	400
Hepburn Sinclair	"	Ja. Red	150
Sweet River	Westmoreland	Ja. Red	300
Mt. Edgecombe/ Achindown	"	Ja. Black/Ja. Red	Net after transfers 300
Enfield	"	Ja. Red	500
Caymanas Est.	St. Catherine	Ja. Brah	600
Sub-total			6100
Herds Reduced			
Name	**Parish**	**Herd pre-1990**	**Herd 2005**
Windalco	St. Ann,Manch., St. Catherine	4000 (J. Red, J.Brah)	1260
Errol Flynn Est.	Portland	800 (J. Red)	137
F.M. Jones Est.	St. Thomas	450 (J. Red, J Brah)	120
Midland Ranch	St. Ann	400 (J.Black, J. Red)	96
Thicketts	"	300 (J. Red)	150
Bengal	"	250 (J. Red)	150
Twickenham	"	250 (J. Red)	50
Roaring River/Malvern Pk.	"	400 (J. Red, J. Brah)	145
Woodstock	Westmoreland	500 (J. Red, J. Brah)	150
Paradise	"	300 (J. Red, J. Brah)	94
Allied Farms	Trelawny	600 (J. Brah)	269
Harmony Hall	"	300 (J. Red, J. Brah)	60
New Hope	St. Elizabeth	400	20
Sub-total		8950	2700
Total Breeding Females Lost			**12,350**

Our survey indicates a total herd, among large farms, of 19,820 animals or 42.6 percent of the corresponding population in 1990. Adjusting for a further 1400 head estimated to be held by 4 non-respondents suggests an attrition rate of 54 percent, among large beef farmers. This supports an estimate of a current sub-population on large farms of 21,412. At a mean herd size on large farms shown in our survey to be approximately 320 herds we estimate the number of large farms at 67 primary producers.

In the absence of any more verifiable indicators of attrition rates among medium and small farms, we have applied the ratios found in the 1990 census between Large (> 100 head); Medium (10-99) and Small (1-9) beef producers. These data suggest that large farms accounted for 32.2% of total beef herd, the balance split between small and medium size farms in the ratio 60: 40 respectively. On this basis, the current population of beef cattle is estimated at 66,500 head.

Table 7 summarizes the steps included in estimating the current population of beef cattle and Table 8 shows a comparison of the key statistics of this survey with those immediately preceding.

Table 7: Steps in Estimating Current Beef Cattle Population

	Large Farms	Medium Farms	Small Farms	All Farms
1990 Census				
A. No. Farms	110	2023	18500	20633
B. No. Animals	46548	39721	58481	144750
C. Percent in Size Class	**32.2**	**27.4**	**40.4**	**100**
D. Average Herd Size	423	20	3.2	7.0
2005 Survey Estimates				
i) Ave. Herd Size - Survey	320	41	28	
ii) No. Farms Surveyed	67	-	-	-
iii) Population in Size Class	21412	?	?	?
iv) Popn. Est (Apply C to iii)	**21412**	**18035**	**27053**	**66500**
v) No. Herds (iv/i)	**67**	**515**	**3382**	**3964**
vi) Breeding Herd (0.52*iv)	**11135**	**9380**	**14100**	**34615**

Table 8: Comparative Statistics of Beef and Dairy Farms from Recent Surveys

Survey / Census	**1990** (MinAg)		**1996** (STATIN)		**2004** (JDDB)	**2005** (Jabico/JDDB)	
	Beef	**Dairy**	**Beef**	**Dairy**	**Dairy**	**Beef**	**Dairy**
No. Farms	20633	753	20092	8145	254	3964	224
Area in Pasture (ha)	63320		95649		5420	26,800	5195
Total Herd	144750	22385	*	*	18510	66500	17470
No. Cows	58913	11780	95366	38859	10063	30100	9503
Est. Breeding Herd	***67744***	***13748***	***112026***	***44779***	***11440***	***34615***	***10850***
Effective Stocking Rate (au / ha)	n/a	n/a	n/a	n/a	2.1	1.3	2.1

4.6. Analysis of Results

The sections immediately following analyse and discuss the main findings of the survey.

4.6.1. Average Farm and Herd Sizes – Large Farms

Breed society members accounted for 31 percent of respondents. Mean herd size among pure breeders was 319 head carried at a stocking rate of 0.81 animal units/ha. This compares with averages of 320 head and 0.94 au/ha on large commercial farms. Large farms cumulatively occupy a total of 24,251 ha (59,960 ac), 74 percent of which comprised either improved or native pasture.

4.6.2. Herd Totals and Composition by Breed

Table 9 represents a profile of the population of purebred cattle within the three Jamaican breeds. Purebred Jamaica Red cattle account for 66.9 percent of the population of breeding females of 6,243 carried on pure breeding farms. Jamaica Brahmans account for 18.7%, Jamaica Blacks 8.9%, and other 4.8%. The category 'other' represents mainly crossbred commercial cattle resulting from mating among the Jamaican breeds as well as with exotic breeds.

It should be pointed out that no attempt was made to define the breed-types represented on commercial farms.

Commercial herds were singularly classified as 'other'. It is however suggested that a follow up study be conducted to characterize these animals as they represent a repository from which foundation animals originally from the native beef breeds might be assimilated in any strategy for breed expansion; this being particularly applicable to Brahman cattle, the purebred origins of a significant number still identifiable.

Table 9: Structure of Herds on Pure-breeding Farms - 2005

Class	**Jamaica Red Poll**	**Jamaica Brahman**	**Jamaica Black**	**Other**	*Total*
Cows	3823	1038	510	756	6127
Bulls	184	57	34	149	426
Steers	99	20	5	49	173
Heifers	1069	385	136	498	2088
Young Bulls	241	98	29	29	397
Heifer Calves	720	156	89	1017	1982
Bull Calves	618	166	79	759	1622
Total Herd	**6754**	**1920**	**882**	**3257**	**12815**
Estd. Breeding Herd	**4179**	**1166**	**555**	**922**	**6243**

The size of the effective breeding herd is calculated by adding 1/3 of the heifer population to the number of adult cows. It must be recognized, however, that heifers classified as 'other' on purebred farms, are likely to contribute substantially less to the effective breeding herd.

With only 555 post-pubertal females, the size of the Jamaica Black population raises questions about the breed's continued viability. The development of local competencies in conservation and expansion strategies, including multiple ovulation and embryo transfer (MOET) and cryo-conservation, assumes great urgency with respect to all Jamaican Breeds but particularly to the Blacks.

4.6.3. Farm Size and Area in Pastures

The total area occupied by respondent farm sizes, and area in pastures within size classes are shown in Table 10. Table 11 extrapolates the sample data to a probable profile of the national situation with respect to pastures.

Table 10: Farm Size and Area in Pasture among Respondent Farms

Size Class (n)	Land Area (ha)	Mean Farm Size (ha)	Area (ha) in Pasture *(%)*	Mean Pasture Area per Farm
Small (26)	36.5	1.4	34.9 ***(96)***	1.3
Medium (40)	624.0	15.6	539.0 ***(86)***	13.5
Large (62)	24251	391.1	14297 ***(59)***	230.6

The 62 large farms canvassed, occupied a total area of 24,251 ha (59,900 ac.). Mean sizes of respondent farms

engaged in beef cattle rearing were 391 (Large); 15.6 (Medium) and 1.4 ha (Small).

Actual farm area allocated to pastures represented 0.96, 0.86 and 0.59 of total farm area on small medium and large farms.

Table 11: Projected Total Area in Improved Pasture on Beef Farms

Size Class (n)	Total Farm Area (ha)	Area in Pasture	Percentage Improved	Total Improved
Small (3382)	4735	4397	36	1583
Medium (515)	8034	6953	49	3407
Large (67)	26204	15450	53	8189
All (3964)	**38,973**	**26,800**	**49**	**13,179**

It should be noted that among the small farmers sampled, ten were landless, their herds ranging from 15-164. Given the disproportionate weighting of this sub-group it is probable that mean farm size among small farms and the projected area occupied by these farms might be understated by as much as 20 percent.

On this basis it is probable that small farms engaged in beef might currently occupy 5,682 ha and cumulatively all size classes, 39,920 ha (98,602 ac).

4.6.4. Pasture Profile

Pasture currently accounts for 69 percent of farms on which beef cattle rearing is included. Improved pastures comprise 49 percent of total pasture area, the equivalent of 19,561 ha. Based on the total area in pasture, average stocking rate on beef farms is estimated at 1.3 au/ha.

The data provided to canvassers with respect to improved pastures and the projected total acreage of each in the national beef herd is shown in Table 12. As was the situation on Dairy Farms, where African Star grass was the predominant sown species (74.4%), this was also the preferred species on beef farms (55%), the total area under cultivation estimated at 10,758 ha.

The categorization by farmers into 'other' among improved grasses is unclear and it is felt that their categorization might have included largely, native species such as Seymour and Crab grasses. Where other unlisted improved species such as King grass were cultivated a small number of respondents so indicated.

It ought to be noted that Tifton 85, a variety established to be of significantly higher yield potential than even African Star grass (Miller et al 2003; 2005; McLeod, D.S. (Pers. Comm) has not found a place on Beef Farms. On Dairy Farms this cultivar accounts for only 1.1 percent of sown pasture.

This is a reflection of the tentativeness of Jamaican graziers with respect to overall pasture improvement, a situation underlined by the harsh economic environment confronted by cattlemen over recent years.

It is however, encouraging that 12 farmers reported employing irrigation, 10 of them using sprinkler systems. Among these one medium sized grazier in St. Elizabeth was able to maintain a herd of 120 on 28.3 ha irrigated pasture through the judicious application of Fertilizers (92.8 kg N/ha in 4 applications) in combination with a modicum of relatively low cost supplementary feed.

4.6.5. Profile of Ownership and Employment Levels

Table 12 summarizes the data gathered from the survey with respect to the profile of the ownership of Beef Farms:

Table 12: Gender Profile of Ownership of Beef Farms

Farm Size	Gender			
	Corporate	Male	Female	All Farms
Small	-	24	2	26
Medium	2	34	4	40
Large	31 (23)	27 (15)	4 (2)	62 (40)
All	33 (23)	85 (15)	10 (2)	128 (40)

( ) Purebred Farms

The data indicate that 25.8 percent of surveyed farms were managed by employed professionals (52 percent of all large farms and 57.5 percent of farms engaged in pure breeding). Female owned/operated farms represented 7.8 percent of the total sample but only 5 percent of purebred farms. Among small and medium-sized farms females represented 9 percent of the ownership.

With respect to the labour force primary beef producers sampled employed a total of 618 persons, 11.7 percent being female (Table 13).

Table 13: Gender and Distribution of Employees between Size Classes

Size Class	Sex of Employees		Labour Force
	Male	Female	
Small	11	1	12
Medium	64	3	67
Large	471 (354)	68 (62)	539 (416)
All	546 (354)	72 (62)	618 (416)

The survey total of 618 employees gives an estimated mean number of employees of 4.8 per farm overall and 10.4 persons per Pure Breeder. Females represented 11.7 percent of personnel employed on beef farms; 14.9 percent on purebred farms.

Table 14 sets out the consultants' estimate of the number of employees within size groups.

Table 14: Projected Hired Labour Force on Beef Farms

			Gender		Total
Size Class	**Mean / Surveyed Farm**	**Est. No. of Farms**	**Male**	**Female**	
Small	0.46	3382	1426	130	1556
Medium	1.68	515	824	39	863
Large	8.70	67	509	74	583
All	**0.76**	**3964**	**2759**	**243**	**3002**

The consultants estimate direct employment on beef farms at approximately 6,790 persons, hired labour accounting for 3002.

4.6.6. Feeding Systems and Equipment employed on Beef Farms

The predominant system of primary beef production might be classified as suckler-herd or cow-and-calf operations; feedlot operators and exclusively grass finishing operations (1) represented by only 6 entities (Table 15). Two feedlot operators were parts of integrated farm businesses while three were integrated with abattoirs. One stand-alone feedlot operation, formerly operated in association with an abattoir, was canvassed in St. Mary.

Table 15: Feedlot and Grass- Finishing Operations

Operations	Parish	System	No. Head on Lot
Operation #1	St, Catherine	Feedlot/Abattoir	1120
Operation #2	St. Elizabeth	Cow-calf/Feedlot/ Abattoir	100
Operation #3	St, Catherine	Feedlot/Abattoir	60
Operation #4	Hanover	Feedlot/Abattoir	20
Operation #5	St. Mary	Feedlot	55
Operation #6	St. Elizabeth	Grass Finisher	20

Pasture was overwhelmingly (93%) the base of the feeding system, supplemented in 16.4 percent of cases with concentrate feeds. By products provided the base for the feedlot operations. Seven suckler herds also reported the use of a proprietary feed based upon the bio-fermented by-products.

Fifty-two (52) farms reported owning tractors (app. 1 per farm), while only seven (7) farms owned fodder conservation equipment. Appendices 11—14 give details of the equipment and usage methods reported by respondents.

With respect to tick control, 98.4 percent of respondents reported a defined method of control, the predominant equipment being manual spray systems (98 respondents). Spray races and cattle dips, were found primarily on large

farms (93%) but accounted for only 45 percent of the tick control equipment on these.

The responses with respect to irrigation (Appendices 14 and 34) suggest that only 12 farms applied irrigation either through sprinkler systems (10) or by flood irrigation (2). The data indicate that no more than six (6) beef farms sourced water from the National Irrigation Commission.

Table 16 lists equipment and other physical facilities held on beef farms and their valuation, on a replacement basis.

Table 16: Valuation of Assets Held on Beef Farms

Item	Nos. in Survey	Projected Country Total	Replacement Value	
			Per Unit ($'000)	Total Value ($M)
Equipment				
Feed Silos	8	8	30	0.24
Stand-by Generators	17	17	750	12.75
Tractors& Attachments	52	110	2100	231.00
Hay/Fodder Equip.	7	7	2000	14.00
Spray Races	18	18	700	12.60
Cattle Dips	10	10	90	0.90
Mist Blowers	22	700	38	26.60
Hand Pumps	76	2250	6.6	14.80
Deep Wells	13	13	8500	11.05
Sprinkler Irrigation Systems (4-ac. Sets)	10	10	180	1.80
Relift Pumps	7	7	700	4.90
Sub-total Equipment				**331.00**
Land		26,800 ha	70,000	**1876.00**
Housing and Farm Buildings		2 million sq. ft.	2200	**4400.00**
Sub-total: Physical Assets				**6607.00**
Livestock				
Cows		30,100	15,000	451.50
Service Bulls		1,700	25,000	42.50
Young Bulls		2200	30,000	66.00
Heifers		10,500	18,000	189.00
Heifer Calves		11,000	8,000	88.00
Bull Calves		11,000	10,000	110.00
Sub-total: Livestock				**947.00**
TOTAL ASSET VALUE				**7554.00**

4.7. Farmers Perspectives on the Beef Sector

Questions 12-18 of the survey questionnaire sought the views of beef farmers on issues impinging on the beef sector and which they consider the most critical in any effort to rehabilitate the sector. Appendices 15-21 tabulate their responses and Table 17 shows the two most frequently selected responses to each question. The percentages shown in the Table are calculated after omitting the number of farmers giving no response to the question.

Table 17: Farmers' Most Popular Opinions on Key Issues

Issue	Selected Option	% Sample
Most limiting technical input	i) Fertilizer and Pasture Mgt.	51.4
	ii) Other	24.3
Major cause of decline in the demand for local beef	i) Govt's import policy	64.1
	iI) Other	16.0
Main cause of high consumer prices	i) Butchers' margins	46.9
	ii) Retailers' margins	31.9
Fair lease value on holding	i) Below $500	35.9
	ii) $1000-2000/ac.	17.4
Best option for farmer securing more of consumer dollar	i) Certified abattoir with farmers holding equity	63.9
	ii) Other	21.0
Selected drought-coping strategy	i) Sugarcane residues	33.5
	ii) Other	32.1
Best form of Government Intervention	i) Reduced interest rates	42.8
	ii) Higher import duties	36.7

Except for the question concerning their estimation of the lease value of their farmland, farmers availed themselves of the opportunity to list what they perceived as the most relevant answers.

A significant number of respondents (78.8%) recognises that butchers and the retail trade have been realizing very high margins on beef at the expense of beef producers

i) Sixty four percent of respondents indicated that the establishment of a centrally located and certified abattoir and processing facility, in which beef producers are shareholders, would provide the best means by which they could increase their share of the price margin earned between the farm gate and the final consumer.

ii) Sixty four percent of respondents perceive that government's policy on the importation of beef is the major cause of the decline in the demand for locally produced beef.

iii) Fifty one percent of respondents expressed that fertilizer and general pasture management were the main limiting technical inputs in their operations.

iv) The responses indicate that the most effective governmental assistance to the beef farming sector would be by way of fiscal policy interventions.

4.7.1. Technical Inputs Most Limiting to Productivity

Fifty one percent (51%) of respondents to this question identified the level of fertilizer application and general pasture management as the most critical elements which limit levels of productivity on their farms.

A significant number (24%), offered a range of responses other than the three options offered. The most cited 'other' factors are:

i) Unavailability of a service bull (5)
ii) Access to Land (5)
iii) Praedial Larceny (3)
iv) Labour (2)
v) Veterinary Costs (2)
vi) Rumours of mad cow disease (2)
vii) Inadequate options for organic control of weeds in pasture (1)

It is of significance that three Pure breeders cited the unavailability of service bulls as the factor most limiting productivity on their farms. Given the drastic scale-back in the Ministry of Agriculture's loan bull scheme, the Breed Societies might need to give consideration to a structured system of rotating bulls among members.

The emergence of organic production of beef points to a recognition among Jamaican producers of the vast opportunities which have become available in the world

market for organically produced foods. Given the continued high levels of tourist arrivals and the continuing increase in the number of hotel rooms, and growing health consciousness globally, organically produced beef may offer significant market opportunities.

Not surprisingly, access to land was a frequently cited limiting factor among small beef producers. It should be noted that ten farmers canvassed in Clarendon were landless – a parish in which significant acreages on former and existing sugar estates remain idle. Our canvassers also reported the sighting of a herd of approximately 500 head of cattle grazing commonly at Fort Stewart, St. Mary, an otherwise unused part of the former Gray's Inn Sugar Estate. A system, as has been applied in Antigua, of renting lands for common(s) grazing at nominal rates might contribute to overcoming the limitation imposed by the cost of land sub-division characteristic of traditionally accepted land settlement schemes. This would need to be supported by research into the effective management of common(s) grazing to identify optimal stocking rates per season in order to raise the productivity of these farmers.

'Praedial' larceny has again emerged as a threat to beef producers, given the favourable prices currently being offered for beef. With cull cattle values as high as $36,000, the theft of cattle needs to be reclassified other than as 'praedial larceny' which has the connotation of petty theft and penalties reviewed to reflect the severity of

the loss to the farmer. Additionally, the reports of organized, armed and mobile groups of rustlers indicate a need for an urgent review by Government of effective deterrence to cattle stealing.

4.7.2. Major Reasons for Decline in the Consumption of Local Beef

Two-thirds of respondents perceive Government's import policy relating to the importation of beef as the major factor contributing to the decline in demand for beef. This speaks to a need to revisit the current tariff regime to determine, given our international obligations, mechanisms which might afford the sector sufficient breathing space for recovery. The trade statistics available from STATIN indicate significant increases in the importation of box beef which competes directly with the local sector for the bulk of the domestic market.

It is apparent that the current level of 86 percent duty on these cuts needs to be revised in order to stem the decimation of breeding herds which has contributed to the current demand/supply imbalance.

Both producer and Government need to appreciate the tremendous opportunities for a structured redevelopment of the beef industry presented by the increased prices on offer. If mishandled, however, this could lead to intensified liquidation of both beef and dairy herds as farmers avail

themselves of the opportunity of exiting the industry with minimum loss.

Among the 'other' factors cited for the reduced demand for local beef the most frequent was fears about ' Mad Cow' disease. In reality, however, this apprehension cannot be reconciled with the increased level of imports, a more likely source of the disease, and the overall increase in per capita consumption of beef.

While the consumption of beef has increased by 32 percent between 1993-2003, local production remained relatively flat over the same period and has been declining since 2003. The expanding growth of the patty sector and the fast food trade points to significant opportunities for growth. Currently, local producers are unable to take advantage of the growing demand for beef because of a severely decimated population of beef and dairy cattle.

From the consultant's perspective, it would appear that the issue of quality is responsible for the high level of imported beef by the hotel sector. At the lower end of the market, the high retail prices of local beef render it uncompetitive with heavily subsidized imported beef, primarily offals and other low-end cuts, even with an eighty six percent import tariff.

Improved production cost efficiencies and the adoption of international quality standards with respect to the

slaughter and processing of meat would increase the competitiveness of local beef producers at the upper end of the market.

Additionally Jamaica's accession to the CSME is being seen as an opportunity for significant growth. Already, one vertically integrated local fast food chain exports to the Netherlands Antilles and has reached the advanced stage in effecting exports to Trinidad. On this basis, the entity is cautiously forecasting a 3-5 percent annual growth for its output, which is nearing saturation in the local market.

One perceptive respondent reflected on the opportunities he perceived deriving from the growing popularity of the 'Atkins diet' locally and internationally for beef, a trend which necessitating a structured redevelopment of the local cattle industry.

4.7.3. Reasons for the High Retail Price of Beef

Seventy-nine percent of farmers identified the high margins being demanded by middlemen as the main reason for the high retail price of beef. Only 3.4 percent felt that the level of technology applied on farm had any impact on final price.

As justification given for this 'it wasn't me' response, a number of farmers alluded to the fact that the changes in consumer price since 2003 have not moved in lockstep

with the five-fold change from $8-10 per pound live weight being offered between 2002 and 2003 to the $40-50 per pound currently. Concomitantly, beef prices in the municipal markets have moved fifty percent from approximately $80-$90 per pound to $120-$140 currently.

Virtually no recognition was given to the fact that price is a function of supply and demand. Traders and processors have indicated that their demand for local beef is not being satisfied and, as price increases, they fear, if the trend continues, it may become more attractive to satisfy their demand by imports.

Two-thirds of the respondents surveyed recognize that beef producers ought to invest in the value-added chain to increase their overall margins.

4.7.4. Farmers' Assessment of a Fair Lease Value for their Properties

The modal estimate of the lease value of their holdings selected by respondents was in the range-class "$500 (or lower)" per acre. However, given the fairly even distribution in the range-classes selected it was considered that a weighted average, using the mid-points of each range-class, might give better representation of the responses, which might be used in any valuation of lands currently allocated to beef production. With respect to the class 'other', estimated lease values ranged between $2000-$4000 per acre. For this class a modal value of $2500/ac was selected. On this basis,

the weighted average of the lease value of lands currently in beef production was estimated at $1,408.00 per acre ($3.500/ha).

Applying a standard Ministry of Agriculture formula [*Lease Value = (Current Value x 0.05)*] yields an average valuation of $28,000 per acre ($70,000 per hectare). This contrasts with a common estimate of $50,000 per acre for lands in dairying and seems fair given the relative proportions of pastureland in improved grasses – 49% (Beef) and 88.6% (Dairy).

4.7.5. Farmers Views on Securing a Larger Share of the Consumer Dollar

Close to two-thirds of the respondents expressed the view that a certified abattoir and processing facility in which farmers held equity would be the most effective means of securing a larger share of the consumer's dollar.

This speaks to a recognition of the importance not only of moving beyond primary production but also of the importance of scale economics to effective vertical integration.

"Specific responses in the category 'other' accounted for 25 percent of responses and varied widely. Two farmers intimated that the main focus should be on improving the quality of local beef in order to drive demand.

4.7.6. Strategies for Coping with Drought

Drought-coping strategies practiced by beef farmers varied widely.

Resort to the use of sugar cane residues (33.6%) was most common among medium and small farmers. The use of by products (24.8%) also remains a common strategy for supplementary dry season feed deficits. Among the strategies listed as 'other' (32.1%) common strategies included manipulating intervals between grazings and scheduling the breeding system so as to synchronize calf sales with the historical drought periods. The reported low use of hay as dry season feed (9.5%) may be a reflection of availability and/or perceived low benefit relative to the cost of commercially produced hay.

4.7.7. Views on the Best Form of Government Assistance to the Cattle Sector

The two most popular suggestions offered by farmers as to the best form of Government support are:

1. Reduced interest rates on farm loans (42.8%)
2. Increased duties on imported beef (36.7%)

Other suggestions include the removal of import duties, and the exemption from General Consumption Tax on imported inputs for use by the beef and dairy sectors

It may be inferred that farmers consider technology a less limiting factor to the development of the beef industry than Government intervention through fiscal policy.

4.8. Abattoir Capacity, Current Throughput and Supply Demand Imbalance

The information supplied by eight (8) abattoir operators is summarized in Table 18.

Table 18: Abattoir Operators – Summary of Statistics Supplied

Operations	Parish	Capacity (Head/wk)	Current Throughput	Weekly Throughput (2005:2004)	Major End User
Operation # 1	St. Cath.	400	260	0.72	Fast Food (70%)
Operation # 2	Kingston	300	40 (3d)	0.95	Patties (80%)
Operation # 3	Clarendon	250	180 (6d)	0.86	Patties (95%)
Operation # 4	Hanover	150	45 (3d)	0.75	Supermarket (90%)
Operation # 5	Hanover	60	10 (3d)	0.83	Supermarket (90%)
Operation # 6	St. Cath.	150	35 (3d)	0.44	Patties (70%)
Operation # 7	St. Cath.	30	5 (2d)	0.50	Onsite sales (80%)
Operation # 8	St. Cath.	50	12 (2d)	0.60	Supermarket (80%)
Total		**1390**	**587**	**0.71**	

The interviewees were all private operators, including the lessees of the KSAC abattoir, a consortium of eight (8) butchers who together account for 86 percent of current throughput at this facility, the balance being accounted for by other butchers who rent capacity from the consortium.

The eight interviewees, cumulatively, represent a cattle slaughter capacity of 1,390 head per week (72,280 per annum). It should be noted that none of these abattoirs holds international standards accreditation. However, one facility in central Jamaica was reportedly designed to be HAACP compliant.

Slaughter capacity of individual operations ranged from 30 (part of a primarily pork processing facility) to 400 per week, the latter owned by the Jamaica Broilers Group.

Current throughput in the 8 abattoirs is approximately 590 per week. Given that on most large cow-calf operations, a closed breeding system is practised, it is felt that the above estimate might represent a seasonal low. Adjusting upward by a factor of 15 percent for this seasonal effect predicts a 2005 throughput of 35,300 head of cattle.

Total cattle slaughtered in 2004 approximated 52,379 head. On the basis of a reported a 2005:2004 average shortfall of 29 percent, the combined throughput in 2004 would have represented 95 percent of national output of beef or 10.6 million kg. The consultants, therefore, forecast that in 2005 the subject abattoirs will slaughter 35,330 head of cattle, 95 percent of the projected national total of 37,200 head. Given a current four-year average carcass weight of 213 kg, beef production for 2005 is not expected to exceed 7.92 million kilograms significantly.

Our estimates of extraction rates from the cattle population (Table 19) suggest that based on the 1990 Census and Slaughter Data for

the same year (Data Bank), extraction from within the beef and dairy breeding herds were 87 and 75 percent respectively, the beef population accounting for 85 percent of the cattle slaughtered.

Table 19: Estimate of Extraction Rates

	1990	2004	2005
Beef Population	144,750		66,500
Dairy Population	22,385	18,511	
Beef Breeding Herd	66,860		34,615
Dairy Breeding Herd	13,750	11,440	10,800
Total No. of cattle / herd slaughtered	**68,461**	**52,379**	
Est. Proportion Beef: Dairy	85:15	90:10	
Est. from Beef Farms	58,190	47,140	
Est. from Dairy Farms	10,271	1,857	
Extraction Rate (Beef)	87%		
Extraction Rate (Dairy)	75%		

Our estimate of the current beef and dairy breeding herds of 34,600 and 10,800 respectively would project extraction from each population at 30,120 and 8,100 respectively; a combined total projection of 38,220 and a variance of 2.7 percent compared to the forecast above.

It should be noted that applying 1990 as baseline assumes a stable breeding herd. Recent evidence confirms a decimation of the breeding herds in both the beef and dairy sectors, a continuation of which into 2005 would invalidate our slaughter projection of between 37,000 and 38,000 head.

4.9. Contribution of the Local Cattle Sector to Economic Development

Annex 7 gives details of the estimated contribution of the local beef and dairy sub-sectors to total GDP using base data obtained from the STATIN 2003 Survey of Living Conditions data file.

The beef and dairy sectors combined contributed an estimated $5.03 billion to GDP in 2003, the relative proportions being 82:18 (Beef:Milk). If this is adjusted for the estimated 15% contribution to beef production by the dairy sector the adjusted contributions are J$3.4 billion and J$1.6 billion for the beef and dairy sub sectors respectively.

Compared to returns at farm gate of $1.27 billion, the direct contribution of the sector to GDP represents a multiplier effect of 3.96.

Currently, the cattle sector is estimated to provide direct employment for 7,750 persons, hired labour representing 45.7 percent of total employment. The annual wage bill is estimated at $1.2 – $1.4 billion.

These estimates omit the linkages of the sector to the feed and fertilizer manufacturing and other input supply sectors. Current feed and fertilizer usage by the Dairy sector is estimated at 0.44 kg per litre and 51 kg (Jennings 2005) was equivalent to an estimated total expenditure of J$108 million in 2004.

4.10. Impact of Attrition on Rural Employment

Employment level in the beef sector is estimated at 3002, the equivalent of 0.76 employee per farm. The dairy sector accounts for approximately 539 employees, an average of 2.3 direct jobs per farm.

Assuming similar employment levels per farm in 1990, direct job losses over the past fifteen years is estimated at 13, 870 in the beef and dairy sectors combined.

4.11. Succession Issues

The survey instrument was not designed to capture data regarding the age of beef and dairy farmers and the issue of succession planning. However, the canvassers and œnsultants, in their interviews with several prominent farmers, observed that an estimated 90% to 95% of beef and dairy farmers were well advanced in age. In fact, many expressed grave concerns re the continuity of the sectors.

Changing social lifestyles, the relatively high capital investment required for entry and the low returns on investment in beef and dairy farming, and the misconceived notion that large scale cattle farming is a pastime of the rich, are some factors which may be attributed to the unattractiveness of the cattle sector to young people.

It would be interesting and instructive to determine how much of the attrition that has occurred over the past fifteen years is the

result of children turning their backs on the beef and/or dairy farms which their parents would have wished to pass on to them.

The situation, though, is far from hopeless. Two very young farmers expressed their confidence in the sector and lamented that the high cost of capital is precluding them from exploiting clear opportunities within the beef sector.

4.12. Financial Analysis of Cow-Calf Operations

Cow-calf operation is a major determinant of the future development of the beef sector. However, the general feedback given to queries about the profitability of a typical cow-calf operation suggests that it is a loss leader, at best. Given the importance of the cow-calf operation component to the future of the beef sector, the consultants considered it necessary to examine the financial aspects of the operation.

The analysis considered two scenarios, Farm A and Farm B, using the average size of large farms (394 hectares) found from the survey, as the assumption for the farm size. Both scenarios assumed that pasture comprises 59 percent of total farm area. Farm A was assumed to have planted improved grasses on 49 percent of its pasture (the typical value from the survey). Farm B cultivated 75 percent of its pasture in improved grasses.

Our analysis (Annex 5) shows that at the scale typical of purebred operation (320 head of cattle on 394 ha), the returns are unlikely to be more than marginal at best, even assuming ideal herd performance coefficients.

Farm B projects an increased carrying capacity by doubling fertilizer rate to two applications per year on the improved pastures, thus increasing the size of the breeding herd from 166 (Farm A) to 260 mature females.

Applying the same performance coefficients, a pure-breeder operating under similar conditions could expect to realize returns of approximately 17 percent over expenditure.

The analysis highlights the critical importance of increasing carrying capacity, through good pasture management, to sustained profitability of beef farms.

On the assumption that a well-managed cow-calf operation is potentially profitable, a medium-term projection has been attempted (Annex 6). The projections indicate that existing farms could double beef output within seven years, through the expansion of the national breeding herd.

A cow-calf operation may even result in greater returns if it is tied into a feedlot, abattoir and processing facility in which the farmer holds equity investment. The full financial benefits of a cow-calf operation, therefore, beg for its integration into upstream integration.

The projected returns may not be attractive enough to a new investor because of the cost of investment capital and the availability of comparatively more attractive investment options.

This in itself provides a barrier of entry and thereby provides an advantage to existing cattle farmers.

Regarding the dairy sector, a revision of earlier projections by the JDFF indicates the potential of increasing total output of milk to fifty million litres by 2014.

5.0 STRENGTHS, WEAKNESSES, OPPORTUNITIES, & THREATS

Based on the survey results, other data referred to for the study, and observations during the data gathering process, factors which may be regarded as strengths, weaknesses, opportunities have been recognized. These elements, crucial to strategy formulation, are listed in the sections immediately hereunder.

5.1. Strengths

i) Both the beef and dairy sectors have, as their genetic base, well developed and highly productive cattle breeds

ii) Both sectors have a core of very experienced owners/managers, workforce, and external resource base

iii) Extensive local and regional research on pasture and animal nutrition is readily available

iv) The composition and high quality of milk from Jamaica Hope cattle provides opportunities for several value-added products

v) The vast majority of Jamaica's arable lands are classified as highly suitable for the cultivation of improved pastures

vi) Jamaica's cattle sector has distinctive competitive advantages *vis-a-vis* other members of the CARICOM trading block

vii) There are substantial idle and/or undeveloped acreages of land which provides a base for significant expansion of cattle production

5.2. Weaknesses

i) Both sectors, but more so for beef, are relatively fragmented with virtually no vertical integration and no apparent collaboration nor strategic alliances among sector participants to take advantage of the benefits of network cooperation

ii) The application of technology is minimal at best

iii) Low levels of efficiency reduces competitiveness and profit margins and reinforces the long held perception that cattle production is a wasteful use of allocated resources

iv) Perception that benefits derived from cattle production are restricted mainly to rich cattle farmers

v) Effective lobbying, aimed at policy makers, is absent

vi) Inadequate use is being made of the extensive research work that has been done in respect of both beef and dairy production in Jamaica

vii) Inadequate development funding is available to the sectors

viii) Milk producers have an over dependence on the fluid milk market in spite of clear shifts in consumer preferences

ix) Weakness in the processing of beef is depriving beef producers of market opportunities

x) The absence of a formal system of animal assessment is preventing the exploitation of the potential export of local cattle breeds

xi) The historical and continuing over-dependence on Government as the main driver of development of the cattle industry is stifling the sectors' own initiative.

xii) Comparatively beef production and dairying are not attractive to new investors as other available investment options

xiii) Recovery time from natural disasters or major errors in judgment or policy shifts much longer than with crops, therefore greater risk

5.3. Opportunities

i) The CSME will provide excellent marketing opportunities for Jamaica's cattle sector, given the country's competitive advantages

ii) Current global forecasts indicate that beef production efficiency will supercede that of poultry and swine, given the projected increase in the price of commercial feeds, and because of greater concerns re environmental issues

iii) The World Bank predicts that as the price of feeds increases and environmental concerns are intensified, cattle production will rely more on pastures, a resource with which Jamaica is well endowed and the soil most suitable

iv) It is predicted (Cornelis de Haan et al, a group of livestock specialists from the World Bank) that livestock will be the world's most important agricultural sub-sector in terms of

value added and land use within the first and second decades of the 21st century. Demand for beef is projected to increase from 209 million tons in 1997 to 327 million tons in 2020 and global milk consumption from 422 to 648 million tons over the same period. Developing countries, such as Jamaica, are expected to meet most of the projected increase.

v) Jamaica's close proximity to the United States, the world's richest market

vi) The increasing popularity of the Atkin's Diet and the rapid growth of the fast food (especially patty) industry in Jamaica is responsible for the reemerging trend towards the consumption beef

vii) Jamaica's increasing tourism trade creates a consistently high demand for primarily high-end beef cuts, which is met mainly from imports

viii) Growing health consciousness and safety standards internationally provide an excellent opportunity for beef producers to exploit the demand for organically produced beef, given Jamaica's endowment of large acreages of lands classified as being highly suitable for the cultivation of improved pastures.

5.4. Threats

i) Importation of highly subsidized beef and dairy products pose a clear and present danger to local producers

ii) The exposure to outbreak of pandemics such as mad cow disease, in Jamaica, through importation

iii) The inability of the sectors to new and young entrants to replace the current ageing owners/operators

6.0 MAJOR FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1. Major Findings

TABLE 20: Summary Of Main Findings

	BEEF	**DAIRY**
No of farmers	3964	245
Distribution by size class	Small (0.85) Medium (0.13) Large (0.02)	Small (0.73) Medium (0.15) Large (0.12)
Total Pasture land (ha)	26800	7225
Percentage in improved grasses	49	89
No. of employees	3002	539
Estimated Job Losses (1990 – 2005)	12,680	1,190
Cattle population	66500	17300
Percent Purebred Cattle	14.4 (JR 70.6% of purebred)	85.5 Jamaica Hope
Total Breeding Herd	34615	10690
Stocking Rate (au/ha)	1.29	1.48
Installed processing capacity	76900 head	80M litres
Throughput 2004	52379	15.4M litres
Projected throughput 2005	37000	15.9M litres
Projected throughput 2014	111630	50.4M litres
Valuation on land ($/ha)	$70,000	$125,000
Value of assets employed	$7.5B	$2.3B (2004 -$1.8B)
Total output 2004	9.1 (kgM)	15.4M litres milk 1.6 (kgM beef)
Output/hectare	339.5 kg	4032 litres 221 kg beef
Value of output at current prices	$728M	$498M
Gross returns on asset employed (%)	9.7	21.7
Contribution to GDP 2003	$3.4 billion	$1.6 billion
Main technical limitation	Pasture management	Pasture management
Main strategy for increasing market share	Upstream integration through central abattoir	Upstream integration through JDFF
Perceived role of Government	a) Reduced interest rate on farm loans b) Increased tariffs on imports c) Concession on import duties & GCT on imports for cattle sector	a) Reduced interest rate on farm loans b) R&D

6.2. Conclusion

The beef and dairy sectors are facing several very serious challenges, which, though not insurmountable, will require focussed and sustained effort by all the stakeholders (suppliers, producers, processors, and distributors) and the government. The major and most pressing issues to be considered in any plan of action are:

a) The attrition in the beef and dairy sectors since 1990

b) The prevailing low levels of efficiency, resulting in marginal returns on investment

c) Inadequate use of available technology

d) The high cost of financing

e) The unattractiveness of the sectors to young persons especially in view of the advanced ages of most of the present owners

f) The fragmented structure of the sectors, which precludes the benefits that can be achieved through cooperation and network alliances

The marked attrition in the beef and dairy sectors since 1990, poses a grave threat to their survival and the obliteration of those sectors would have very serious consequential economic, social, and political implications.

During the last fifteen years, the attrition has resulted in the loss of approximately 13,780 jobs in both sectors combined, thereby increasing rural poverty with all its associated social consequences.

With total investment estimated at $9.8 billion, the sectors remain significant components of the national economy in general but the rural economy in particular. Their collapse, therefore, would have severe negative economic and social impact nationally.

It is in the interest of all concerned to develop national strategies and programs to arrest the problems affecting the sectors.

Returns on capital employed are sub-optimal due to low level of applied technology, particularly with respect to the utilization of pastures, industry structure (little or no farmer/consumer interface) and the need for an effective and enabling tariff regime.

The absence of a culture of family farming and the high average age of cattle farmers pose a severe threat to the continuity of the sector.

6.3. Recommendations

On the basis of the findings, the consultants propose the following recommendations:

1. As a matter of urgency, the key stakeholders within the beef and dairy sectors should be apprised of the findings of this study and their input, cooperation, and commitment sought in the development of a national plan for the comprehensive rehabilitation of the cattle sector.

2. The revitalization program, though soliciting Government's support and facilitation, should be private-sector-led. Government's role should be that of facilitator and enabler and confined primarily to the following:

    a) The creation of a fiscal policy environment, which would provide, over the medium term, a cushion against heavily subsidized imports as well as concessions on duties and General Consumption Tax on imported inputs.

    b) Ensuring the sustained generation of cost-effective appropriate technology for beef and milk and value added production by enabling the R&D arm of the Ministry of Agriculture and the Scientific Research Council.

    c) Raising the competency level of farmers and farm employees through RADA, HEART/NTA and other educational institutions.

3. The Jamaica Livestock Association, given its stable position at the core of the livestock industry for more than sixty years, is placed uniquely to spearhead the development of the rehabilitation programme and administering its implementation.

4. The rehabilitation programme should focus on:

   a) Increasing the level of productivity on beef and dairy farms by the application of greater levels of technology

   b) Reducing the cost of production to the sector through reduced tariffs on imported inputs

   c) Increasing the proportion of improved grasses on beef cattle farms from the present 49% to 80% and on dairy farms from 89% to 95%, within 5-8 years

   d) Implementing, through private sector initiative, a comprehensive and effective programme of animal evaluation, which is a prerequisite for capitalizing on the projected increase in global demand for tropical animal genetics

   e) Facilitating the availability of low cost capital with extended payment periods to the sectors to facilitate the requisite development initiatives

   f) Developing programs and strategies to make the sectors more attractive to young persons in general but to more females in particular

g) Facilitating greater levels of cooperation among members of the beef and dairy sectors, through the promotion of network collaboration

h) Establishing, as a matter of priority, a centrally located and certified abattoir and meat processing facility, allowing beef farmers the option of investing equity in its capitalization

5. A proposal should be developed and submitted to Government for the restructure and/or divestment of the milk-marketing project of the Jamaica Dairy Farmers Federation to ensure equity participation by farmers and effective management.

BEEF CATTLE SURVEY – JAMAICA **ANNEX 1**

1. IDENTIFICATION

Name of Farmer/Enterprise _____

Address of Farmer _____

_____ **Parish** _____

Location of Farm _____
(If different from above)

_____ **Parish** _____

2. LAND USE

		ACRES				SQ.
(a) Total Area of Land Operated						
(b) Total Area in Pasture						
- Improved						
- Unimproved						
(c) Pasture type and Area	African Star					
	Pangola					
	Guinea					
	Tifton					
	Bracharia					
	Other					

3. HERD SIZE

CLASS	**BREED**				**TOTAL**
	J. Red	**J. Brahman**	**J. Black**	**Other**	
Cows					
Bulls					
Steers					
Heifers					
Young Bulls					
Cow Calves					
Bull Calves					

4. EMPLOYMENT

EMPLOYMENT	MALE	FEMALE
Full-Time		
Part-Time		

5. FEEDING SYSTEM

Feeding System	**Pasture Only**	**Zero-Grazing**	**Concentrate**	**By Products**	**Other**
(tick)					

6. DISPOSAL

(a)

	Sold to	**Sale Unit live wt. or per unit**	**Price**	**Total Receipts (J$)**
(i)	Butcher			
(ii)	Own Meat Operation			
(iii)	As Fatteners			
(iv)	As Breeding Stock			
(v)	Other			

(b)

Animal Type	**Cows**	**Heifers**	**Bulls**	**Steers**	**Calves**	
					M	**F**
Number						

9. EQUIPMENT EMPLOYED

Feed Silo (Bin)	**Yes**	☐	**No**	☐
Stand-By Generator	**Yes**	☐	**No**	☐
Tractor for Tillage	**Yes**	☐	**No**	☐
Hay/Silage Making Equipment	**Yes**	☐	**No**	☐

10. SPRAYING EQUIPMENT **Spray Race** ☐ **Dip** ☐ **Mist Blower** ☐ **Hand Pump** ☐

11. IRRIGATION

Irrigation Source: **Own Well** ☐ **NIC** ☐ **River** ☐ **Pond** ☐ **None** ☐

Irrigation Equipment: **Sprinkler System** ☐ **Flood** ☐ **Other** ☐
Relift Pump ☐ **Pressured Water** ☐

12. Which technical input most limits the productivity of your farm?

(a) Fertilizer rates and general pasture management ☐ (b) Level of supplementary feeding to herd ☐

(c) Herd fertility ☐ (d) Other (specify _____

13. Demand for local beef has fallen 40% since 1992. Which do you consider the major cause?

(a) Cost of local beef to the consumer ☐ (b) Government's policy on beef imports ☐

(c) Changing consumer tastes ☐ (d) Other (specify _____

14. What do you consider the main cause of the high cost of beef to the consumer?

(a) Level of technology applied on farms ☐ (b) High margins taken by butchers ☐

(c) High margins taken by retailers ☐ (d) Other (specify _____

15. What do you consider a fair lease value for your farmland?

(a) Below $500 per acre ☐ (b) $501 - $999 per acre ☐

(c) $1000 - $2000 per acre ☐ (d) Other (specify _____

16. How can beef farmers secure for themselves a larger share of the consumers' dollar?

(a) Individual farmers getting into feedlotting (b) Farmer groups establishing feedlots and small abattoirs

(c) Establishing a central certified abattoir in which farmers are shareholders ☐

(d) Other (specify _____

17. What is your personal strategy for coping with droughts?

(a) Feed sugar cane residues ☐ (b) Feed hay, silage, haylages etc. ☐

(c) Feed by products ☐ (d) Other (specify _____

18. In which way might Government best assist local beef / (dairy) farmers?

(a) More focussed research into technical problems faced by cattle farmers ☐

(b) Reduced interest rates on farm loans ☐

(c) Increased duties on imported beef / (dairy) products ☐

(d) Other (specify_____

Other Comments _____

_____

_____

_____

Canvassing Team and Assigned Parishes

Name of Team Member	Assigned Parishes
V. G. Mitchell	St. Catherine
	Clarendon
	St. Mary
R. C. Miller	St. Ann
	Trelawny
	St. Elizabeth
D. L. Ffrench	St. Mary
	St. Ann
	St. Elizabeth
J. L. Logan	Manchester
	St. Elizabeth
	Westmoreland
B. H. Lawrence	Hanover
	Westmoreland
	St. James
P. G. Jennings	Portland
	St. Thomas

List of Farmers Surveyed

CLARENDON			
SPENCER	Dudley	Foga Road	Four Paths P.O.
WILLIAMS	Wayne	Green Park, Sandy Bay	Palmers Cross P.O.
BROWN	Donovan	Gimme Me Bit	Gimme Me Bit P.O.
BROWN	Ronald	Content	York Town P.O.
BADAHSINGH	N.	Longwood	Race Course P.O.
NEWELL	Eric	Upper Rhymesbury	Osbourne Store P.O.
THOMPSON	Webley	Gayle	Lionel Town P.O.
ELLINGTON	E.	Farquahar Beach Resort P.O.	
YATES	Wendel	Woodley, May Pen P.O.	
JUICI LTD		Clarendon Park	Comfort, Osbourne Store
DONALDSON	C.	New Bowens	Hays P.O.
DARBY	Charles	York Town P.O.	
HANOVER			
QUARRIE	Noel	Haughton Grove	Ramble P.O.
GARDNER	Cleveland	Chichester	Ramble P.O.
WEBSTER	Desmond	Copse P.O.	
BINGHAM	Esmeralda	Green Island	
WELLINGTON	Ebenezer	Haughton Court	Lucea
LEWIS	Vincent	Chester Castle P.O.	
MCGANN	Pat		
HARRIOT	Earl	Saddler's Hall	Ramble P.O.
WILLIAMS	Michael	Saddler's Hall	Ramble P.O.
WILLIAMS	Michael	Miles Town	Ramble P.O.
HOPEWELL FARMS		Copperwood	Lucea P.O.
JAM WEST FARMS & ENTERPRISE		Old Hole, Little London	
HAUGHTON HALL		Green Island P.O.	
WRIGHT	Colin	Ramble	
BEDASSE	Cleveland	Rockspring,	Blair Hill P.A.
MARTIN	Neville	Ramble P.O.	
KINGSTON & ST. ANDREW			
WILDISH	Elizabeth	Norbrook Chateaux #8	Norbrook Rd.
MANCHESTER			
MAYNE	Jeff	Kingsland	Hat Field P.O.
WINDALCO		Kirkvine P.O.	
WELLINGTON	Karl	Daley's Grove	Knockpatrick P.O.
WINDALCO		Kirkvine P.O.	
WINDALCO		Kirkvine P.O.	
PORTLAND			
ERROL FLYNN ESTATE		Priestmans River P.O.	

ST. ANN

ADC		Minard Estate, Brown's Town	
TELFER	Noel	Retirement Road	Road Side
COOPER	Stanley	Hinds Town P.O.	Hinds Town
LONG	Maurice		
LINTON	Bobby	St. D'Acre	
CANTABERT		Claremont	
CIRCLE B FARM		P.O. Box 7	Kingston 8
ANNANDALE FARMS		Epworth P.O.	
BENGAL FARMS		Bengal	
TWICKENHAM FARMS		Claremont	
GREENWICH PARK ESTATE		P.O. Box 21	Ocho Rios
UDC FARM		Roaring River	Steer Town P.O.
RAINFORD	Henry	Jamaica Livestock Assn. Ltd.	
MIDLAND RANCH		P.O. Box 48	Claremont P.O.
ORANGE HALL ESTATES		Walkerswood	P.O. Box 1

ST. CATHERINE

CHERRY - GARDENS FARM		Bushy Park P.O.	Gutters, St. Catherine
DUFFUS	Edwin	Spring Village	Bushy Park P.O.
FRAY	Aston	Bushy Park P.O.	
BROWN	Alfred	Sharper Lane, Church Pen	Old Harbour P.O.
WATSON	Winston	Sharper Lane, Church Pen	Old Harbour P.O.
BLACK	Stephen	Big Lane, Church Pen	Old Harbour P.O.
WOODITH	Joseph	Sharper Lane, Church Pen	Old Harbour P.O.
SHERWOOD	Leroy	Sharper Lane, Church Pen	Old Harbour P.O.
BROWN	Ian	Nightengayle Grove Farms	Bushy Park P.O.
MAHABEER	Fitzroy	Bushy Park P.O.	
DELA-HAYE	Laban	Spring Village	Bushy Park P.O.
EDWARDS	Cecil	Bannister	Old Harbour P.O.
CAMBRIA FARMS		Wakefield P.O.	Linstead P.O.
HAMILTON	Courtney	Bog Walk P.O.	
FRANCIS	Roy	Orchard Farm Spn. Twn.	
CONTENT AGRO PRODUCTIONS		McCooks Pen	
MINISTRY OF AGRICULTURE		Bodles Research Station	
TULLOCH ESTATES		Bog Walk P.O.	

ST. ELIZABETH

SHERMAN	Sheila	Luana	
ROGERS	Cecil	Mountain Side P.O.	
CAMPBELL	Ronald	Pepper P.O.	
SIMPSON	Dolly	Goshen PA	
SMITH	Hilma	Goshen PA	
YOUNG	Claudius	Goshen PA	
LEWIS	Geton	Goshen PA	
EULETT	Raldane	Braes River	Grosmons District
LEWIS	Jimmy		
COLQUHOUN	Dukecent	Paynes Town Dist.	New Market P.O.
LYONS	Caswell	Braes River	
GREEN	Noel	Goshen PA	
PALMER	Joseph	Pepper P.O.	
SHERMAN	Ottis	Goshen PA	
SIMPSON	Joel	Goshen PA	
CODNER	Lloyd	Content	Salisbury P.O.
DUNKLEY	Frank	Mountain Side P.O.	
BARKEITH FARM		Mountain Side	
JULY	Cecil	Black River	
GILPIN FARM LIMITED		Treasure Beach P.O.	
LEVY	Austiin	Black River	
JAMES	Michael	Luana Farm	P.O. Box 101, Black River
HENRY	Bernard	Newell	
NEW HOPE FARMS LTD	.	Newton P.A.	
YS(1955) LIMITED		P.O. Box 13	Middle Quarters
GAYLE	Lorin	Southfield	
WIGGAN	Wesley	Fyffes Pen	Black River P.O.

ST. JAMES

MINISTRY OF AGRICULTURE		Montpelier Research Station	
WOODSTOCK FARMS		37 Union Street	Montego Bay

ST. MARY

HADDAD	Peter	Lot 7A Ballards Valley	Hamstead P.O.
WILLIAMS	Keith	P.O. Box 81 High Gate	Blue Gate
LAFAYETTE	Phillip	Enfield	Reading
LYNFORD	Paul	Hamstead P.O.	
NEW GOSHEN FARMS		Lucky Hill P.O.	
GREENCASTLE ESTATE		P.O. Box 16	Annotto Bay

ST. THOMAS

FRED M. JONES ESTATE		P.O. Box 21	Golden Grove P.O.

TRELAWNY

COOK	James	Green Pond	
THOMPSON	Andrew	Hommeromith	Bounty Hill
JAMES	Kenneth	Green Park	Falmouth P.O.
BROWN	Rupert	Green Park Dist.	Falmouth P.O.
CHRISTIE	Fitz		
HARMONIZATION L.TD.		Harmony Hall	Duncans P.O.
HENDERSON	Alec	Orange Valley Est Ltd.	P.O. Box 95, Falmouth
PHILLIPS	Lyle	Silver Grove	P.O. Box 94, Falmouth
ALLIED FARMS LTD	.	Bunkers Hill	

WESTMORELAND

EVANS	Hortense	Darliston P.O.	
WILLIAMS	Vashti	Enfield, Darliston P.O.	
MONTEITH	Noel		Carmel P.O.
ANGLIN	Ralph	Lennox	Carmel P.O.
ANGLIN	Devon	Carmel Moravian Church	Carmel P.O.
NEGRIL SPOT FARM		Box 29, Negril p.o.	
DEWAR	Earl	Bethel Town P.O.	
CAMPBELL	Luther	Carmel P.O.	
MORELAND PENN		Moreland Hill	P.O. Box 91 Negril
JBR WILLIAMS EST.		Copse Mountain	
PARADISE PARK LTD.		P.O. Box 44	Savanna-La-Mar
GRAHAM	Henry	Little London	

LIST OF KEY STAKEHOLDERS INTERVIEWED

Stakeholders	Position	Address
Mr. Noel Arscott	NASA Farm, Rhymesfield Coop	Rhymesbury, Clarendon
Mr, Raymond Brooks	Chairman, Jamaica Hope Breeders Society	Pepper Dairy, St, Elizabeth
	Chairman, Jamaica Dairy Farmers' Federation (JDFF)	
Mrs. Annette Dennis	Director, JDFF	Rhymesbury, Clarendon
Mr. Frank Dunkley	Commercial Farmer, Feedlot/Abattoir Operator	Mandeville, Manchester
Mr. Sam Edwards	Edwards Dairy	Ramble, Hanover
Miss Phyllis Francis	Abattoir/Meat Processing Operator	Orchard Meats, Spanish Twn.
Mr. C.M. Harris	Life Member, Cattle Breeders' Societies	C/o Bodles Agric. Station, Old Harbour
Dr. Richard Harrison	Permanent Secretary, Ministry of Agriculture	Hope, St. Catherine
Mrs. Jasmin Holness	Deputy Director Res. & Dev., Ministry of Agriculture	Bodles Agric. Station, Old Harbour
Mr. Martin Hopwood	Jamaica Hope and Jamaica Red Poll Breeder, Bengal Farms	Rio Bueno, Trelawny
Mr. Sylvan Mc Daniel	Manager, Agric. Div., WINDALCO	Kirkvine, Manchester
Mr. Adam Miller	General Manager, Serge Island Farms Ltd.	Seaforth, St. Thomas
Mr. Lenny Morgan	General Manager, Agricultural Dev. Corp.	Mais House, Hope, Kingston
Dr. Marc Panton	Commercial Beef Producer, Barkeith Farm	C/o Black River P.O.
Mr. H.J. Rainford	Managing Director, JLA, Jamaica Red Poll Breeder	C/o Jamaica Livestock Assn., Kingston
Mr. Oral Rayson	Dairy Farmer, JDFF Member	Broughton, Little London, Westmoreland
Mr. Morrel Salmon	Director, St. Elizabeth Dairy Coop	Cabbage Valley, St. Elizabeth
Mr. H.W. Sicard	Manager, Kingston Abattoir	Newport East, Kingston
Mr. Aubrey Taylor	Director, JDFF Holstein Breeder	Bogue Hill Farm, Bogue, St. Elizabeth
Mr. Derrick Walker	Director, JDFF Director, Rhymesfield Coop	Rhymesbury, Clarendon
Mr. Kenneth Warren	Director, JDFF Director, St. Elizabeth Dairy Coop	Luana, St. Elizabeth
Mr. Mark Wates	Manager, Island Cattle	Cantabert, St. Ann
Mr. Richard Wates	Operations Manager, Content Agro Products	C/o Ja. Broilers Group, Mc Cooks Pen, St, Cath.
Mr. I. Wedderburn	Dairy Farmer, JDFF Member	Springfield, Westmoreland
Dr. Karl Wellington	Chairman, Jamaica Red Poll Cattle Breeders Soc., JLA Director	Daley's Grove, Manchester
Mr. Garrett Williams	Financial Controller, Juici Patties Ltd.	Clarendon Park, Clarendon
Dr. Aston Wood	CEO, Agrocon Ltd., Former Chairman, ADC	Stony Hill, Kingston
Mr. Colin Wright	Director, JDFF, Ja. Hope Breeder, Beef Producer & Abattoir Operator	Ramble, Hanover

Annex 5

Projected Income Statements for Cow-Calf Operations
Using Farm Size (394 ha) Typical of Purebred Herds

	FARM A					FARM B				
REVENUE	**No.**	**Lwt. (lbs)**	**Price/lb**		**Amount**	**No.**	**Lwt. (lbs)**	**Price/lb**		**Amount**
Slaughter Cattle										
Male weaners	58	450	50		1,305,000	96	450	50		2,152,800
Female weaners	25	420	48		504,000	13	420	48		262,080
Cull cows	27	900	42		1,020,600	52	900	42		1,965,600
Sub-total					**2,829,600**					**4,380,480**
Breeding Stock Sales										
Young bulls	4	750	60		180,000	5	750	60		225,000
Heifers	10	700	50		350,000	26	700	50		910,000
Sub-total					**530,000**					**1,135,000**
TOTAL REVENUE					**3,359,600**					**5,515,480**
OPERATING EXPENSES										
Labour for 7 breeding herds				975,000					1,560,000	
Sub-total labour					975,000					1,560,000
Fertilizer				215,894					766,644	
Tickicide				17,082					26,572	
Weedicide				185,000					185,000	
Vet services & supplies @ $600 per cow				145,800					168,000	
Contingency (5%)				28,189					57,311	
Sub-total materials					591,965					1,203,527
Fence Repairs				298,865					298,865	
Water Boots (16 pairs @ 826)				8,260					13,216	
Diesel fuel				472,160					472,160	
Tractor & vehicle mtce.				250,000					250,000	
Utilities				120,000					120,000	
Contingency (5%)				57,464					57,712	
Sub-total production overheads					1,206,749					1,211,953
TOTAL OPERATING EXPENSES					**2,773,714**					**3,975,480**
GROSS MARGIN					**585,886**					**1,540,000**
FIXED COSTS										
Salaries				500,000					500,000	
Property Tax				43,343					43,343	
TOTAL FIXED COSTS					**543,343**					**543,343**
NET INCOME					**$42,543**					**$996,657**
Unit Cost Analysis										
Average Realized Price/kg					$104.48					$103.63
Unit Variable Cost					$86.26					$74.70
Contribution Margin per kg.					$18.22					$28.94
Less Fixed Cost/kg					$13.57					$7.77
Net Income/kg					**$4.65**					**$14.22**

See Coefficients Overleaf

Coefficients for Farms A B

FARM A - COEFFICIENTS						**FARM B - COEFFICIENTS**				
Farm Size (ha)	394					Farm size (ha)	394			
Percentage in Pasture (59%)	232					Percentage in Pasture (59%)	232			
Percentage of Pasture in Improved Grasses (49%)	114					Percentage of Pasture in Improved Grasses (75%)	174			
Mean herd size	320					Mean herd size	500			
Breeding herd size	166					Breeding herd size	260			
Fertility rate	0.85					Fertility rate	0.85			
Weaning rate	0.8					Weaning rate	0.8			
Replacement rate	0.2					Replacement rate	0.2			
Growth	0.05					Growth	0.05			
No. weaners reared/year	133					No. weaners reared/year	208			
Male weaners for slaughter	58					Male weaners for slaughter	104			
Male weaners sold as breeding stock (5%)	4					Male weaners sold as breeding stock (5%)	5			
Male weaners retained for replacement (3%)	2					Male weaners retained for replacement (3%)	3			
Female weaners for replacement (20%) and expansion (5%)	30					Female weaners for replacement (20%) and expansion (5%)	65			
Female weaners forsale as breeding stock (25%)	10					Female weaners forsale as breeding stock (25%)	26			
Female weaners available for slaughter	25					Female weaners available for slaughter	13			
Cull cows	27					Cull cows	52			
LIVEWEIGHT SOLD						LIVEWEIGHT SOLD				
Slaughter Cattle		**Weight (lbs)**	**Total (lbs)**	**kg**		**Slaughter Cattle**		**Weight (lbs)**	**Total (lbs)**	**kg**
Male weaners	58	450	26,100			Male weaners	96	450	43,146	
Female weaners	25	420	10,500			Female weaners	13	420	5,460	
Cull cows	27	900	24,300			Cull cows	52	900	46,800	
			60,900						**95,406**	
Breeding Stock Sales						**Breeding Stock Sales**				
Young bulls	4	750	3,000			Young bulls	5	750	3,750	
Heifers	10	700	7,000			Heifers	26	700	18,200	
			10,000						**21,950**	
Total liveweight sold			**70,900**	***32,154***		***Total liveweight sold***			**117,356**	***53,223***
LIVEWEIGHT RETAINED						LIVEWEIGHT RETAINED				
Young bulls	2	600	1,200			Young bulls	3	600	1,800	
Heifers	30	540	16,200			Heifers	65	540	35,100	
			17,400						**36,900**	
TOTAL LIVEWEIGHT PRODUCED (lb)			**88,300**			TOTAL LIVEWEIGHT PRODUCED (lb)			**154,256**	
TOTAL LIVEWEIGHT PRODUCED (kg)				***40,045***		TOTAL LIVEWEIGHT PRODUCED (kg)				***69,957***

ANNEX 6

Projected Growth in Output from the Beef & Dairy Populations (2005 –2014)

YEARS	BEEF HERD									Dairy Herd				
	Breeding Herd	Calf Births		Replacement Heifers	Heifers for Expansion	Number Slaughtered				Breeding Herd	No. Slaughtered	Total Slaughter	Total Beef Output (Kg M)	Litres Milk (M)
		Male	Female			Culled Cows	Surplus Heifers	Young Bulls/Steer	Total Beef					
2005	34615	13975	13975	6990	1730	6923	5255	13150	25330	9460	7100	32430	7.30	15.90
2006	38575	14755	14755	7790	1930	7640	4740	14010	26390	10870	8150	34540	7.77	19.78
2007	46850	17920	17920	9370	2320	9275	6230	17020	32520	12480	9360	41885	9.42	24.46
2008	55900	21380	21380	11180	2770	11070	7430	20310	38810	14000	10500	49310	11.09	27.44
2009	64960	24840	24840	12860	3220	12730	8760	23600	45090	15100	11300	56390	12.70	29.60
2010	75760	28980	28980	15000	3750	14970	10230	27530	52730	17700	13270	66000	14.85	34.69
2011	87600	33500	33500	17520	4340	17340	11640	31190	60170	19850	14900	75070	16.90	38.90
2012	100970	38620	38620	20190	5000	19990	13430	36700	70120	22500	16870	87020	19.58	44.10
2013	114660	43850	43850	22700	5670	22700	15480	41400	79580	24100	18070	97650	21.97	47.20
2014	133300	50990	50990	26650	6530	26390	17800	48440	92630	25700	19270	111630	25.12	50.40

ASSUMPTIONS

Weaning Rate - 85%
Calf Mortality - 10%
Replacement Rate - 20%
Annual Herd Expansion - 5%
Selection Rate (Young Bulls) - 5%
Adult Mortality - 1%
Weaning Weight (Males) - 202.5 kg (450 lb)
Weaning Weight (Females) - 192 kg (420 lb)
Average Carcass Weight (Beef & Dairy) - 225 kg

Estimated Contribution of Local Cattle Production to Gross Domestic Product

A. BEEF		
i)	Total per capita expenditure - Food and Beverage	$40,185.00
ii)	Per capita expenditure – Meat Poultry and Fish*	8,411.00
iii)	'Meals away from home' as % total food per capita expenditure	22.7%
iv)	Mean per capita expenditure beef (Fresh/Frozen)	221.00
v)	Est. expenditure on beef as 'Meals' away from home (20% x (iii))	1,824.00
vi)	Adjusted per capita expenditure fresh or frozen beef (iv + v)	2,045.00
vii)	Population estimate (2003)	2.64 million
viii)	**Gross Turnover Fresh/Frozen Beef (vi x vii)**	5.40 billion
ix)	CIF value canned corned beef imports (2003)	453 million
x)	Turnover from canned corned beef at 90% trade margin	880 million
xi)	**Grand Total Turnover of Beef Trade**	**$6.239 billion**
xii)	Local production of beef (2003)	13.71 kg M
xiii)	Total imports	9.82 kg M
xiv)	Less corned beef	(4.2) kg M
xv)	Import frozen/chilled beef	5.62 kg. M
xvi)	Estimated value % contribution of local beef	75%
xvii)	**Contribution (direct) to GDP from local beef (vii * xiv)**	**J$4053**
xviii)	Farm gate value of local production @ $67/kg	919 M
xix)	Direct multiplier	4.4
B. DAIRY		
Total Milk Production		18.00 L M
Farm gate price		$18.88
Gross farm gate returns		$347.3 M
Per capita expenditure – liquid milk		$163.06
Est. value contribution of liquid milk in condense/evaporated		$141.52
Est. per capita expenditure – liquid milk		$304.58
Adjustment for meals away from home		+ 22.7%
Population (2003)		2.64 M
Contribution to GDP		**$0.98 B**
Direct Contribution of Cattle Sector		$5.38 Billion

**Does not include heat consumed in fast foods or as canned corned beef*

C. DIRECT EMPLOYMENT	
Total hired labour force – dairy farms	539
Total hired labour force – on beef farms	3002
Est. size of hired labour force – cattle farms	3566
Number Operators (Beef + Dairy)	4209
Number of Persons Employed in Cattle Sector	**7775**

(*Source: STATIN SLC – 2003*)

BEEF CATTLE SURVEY - 2005

APPENDIX 1

Distribution of farms by parish and size class

PARISH	SIZE CLASS			
	Small	Medium	Large	TOTAL
St. Thomas	-	-	1	1
Portland	-	-	1	1
St. Mary	-	4	2	6
St Ann	-	1	17	18
Trelawny	2	2	4	8
ST. James	-	-	1	1
Hanover	1	6	9	16
Westmoreland	1	4	8	13
St. Elizabeth	4	13	12	29
Manchester	1	-	2	3
Clarendon	10	4	1	15
St. Catherine	7	6	4	17
ALL ISLAND	26	40	62	128

BEEF CATTLE SURVEY - 2005

APPENDIX 2

Farm size (ac) by size class

SIZE CLASS	TOTAL FARM SIZE (ac)	MEAN FARM SIZE (ac)
Small	90.10	3.47
Medium	1,541.40	38.54
Large	59,900.00	966.13
ALL	61,531.50	480.71

BEEF CATTLE SURVEY - 2005

APPENDIX 3a

Acreage in pasture by size class

SIZE CLASS	TOTAL ACREAGE IN PASTURE	MEAN ACREAGE IN PASTURE	PERCENTAGE IN PASTURE
Small	86.10	3.31	0.1
Medium	1,331.50	33.29	2.2
Large	35,314.00	569.58	57.4
ALL	36,731.60	286.97	59.7

BEEF CATTLE SURVEY - 2005

APPENDIX 3b

Acreage in pasture by parish and size class

PARISH	SIZE CLASS			
	Small	Medium	Large	ALL
St. Thomas	-	-	350.00	350.00
Portland	-	-	800.00	800.00
St. Mary	-	150.00	930.00	1,080.00
St Ann	-	11.00	13,333.00	13,344.00
Trelawny	3.00	65.50	3,092.00	3,160.50
ST. James	-	-	450.00	450.00
Hanover	8.00	180.00	2,005.00	2,193.00
Westmoreland	6.00	125.00	3,883.00	4,014.00
St. Elizabeth	21.00	413.00	7,703.00	8,137.00
Manchester	8.00	-	2,200.00	2,208.00
Clarendon	0.00	168.00	200.00	368.00
St. Catherine	40.10	219.00	368.00	627.10
ALL	86.10	1,331.50	35,314.00	36,731.60

BEEF CATTLE SURVEY - 2005

APPENDIX 4

Acreage in improved pasture by size class

SIZE CLASS	TOTAL ACREAGE IN IMPROVED PASTURE	MEAN ACREAGE IN IMPROVED PASTURE
Small	31.00	5.17
Medium	650.00	26.00
Large	18,622.00	396.21
ALL	19,303.00	247.47

BEEF CATTLE SURVEY - 2005

APPENDIX 5a

Mean acreage in improved pasture by type of pasture and size class

TYPE OF PASTURE	SIZE CLASS			
	Small	Medium	Large	ALL
African Star	5.00	22.46	292.55	184.05
Pangola	1.00	12.25	138.47	106.35
Guinea	-	8.75	100.29	85.64
Tifton	-	-	0.00	0.00
Bracharia	-	8.50	157.00	124.00
Other	7.40	10.38	144.18	75.13

BEEF CATTLE SURVEY - 2005

APPENDIX 5b

Acreage in improved pasture by type of pasture and size class

TYPE OF PASTURE	SIZE CLASS							
	Small		Medium		Large		ALL	
	Amount (ac)	% of improved pasture	Amount (ac)	% of improved pasture	Amount (ac)	% of improved pasture	Amount (ac)	% of improved pasture
African Star	25.00	0.1	539.00	2.8	12,872.00	66.7	13,436.00	69.6
Pangola	1.00	0.0	49.00	0.3	2,077.00	10.8	2,127.00	11.0
Guinea	-	-	35.00	0.2	2,106.00	10.9	2,141.00	11.1
Tifton	-	-	-	-	0.00	0.0	0.00	0.0
Bracharia	-	-	51.00	0.3	3,297.00	17.1	3,348.00	17.3
Other	74.00	0.4	135.00	0.7	3,172.00	16.4	3,381.00	17.5

BEEF CATTLE SURVEY - 2005

APPENDIX 6

Distribution of farmers by size class and gender

SIZE CLASS	GENDER			
	N/A	Male	Female	ALL
Small	-	24	2	26
Medium	2	34	4	40
Large	31	27	4	62
ALL	33	85	10	128

BEEF CATTLE SURVEY - 2005

APPENDIX 7a

Distribution of cows by parish and size class

PARISH	SIZE CLASS					
	Small		Medium		Large	
	NO.	MEAN	NO.	MEAN	NO.	MEAN
No Response	0	0	-	-	-	-
St. Thomas	-	-	-	-	122	122
Portland	-	-	-	-	137	137
St. Mary	-	-	23	6	350	175
St Ann	-	-	2	2	2935	173
Trelawny	27	14	12	6	474	119
ST. James	-	-	-	-	83	83
Hanover	6	6	101	20	710	79
Westmoreland	4	4	66	17	1651	206
St. Elizabeth	18	5	190	15	1997	166
Manchester	9	9	-	-	548	274
Clarendon	299	30	194	49	80	80
St. Catherine	84	12	94	16	129	32
ALL	447	17	682	17	9216	149

BEEF CATTLE SURVEY - 2005

APPENDIX 7b

Distribution of bulls by parish and size class

PARISH	SIZE CLASS					
	Small		Medium		Large	
	NO.	MEAN	NO.	MEAN	NO.	MEAN
No Response	0	0	-	-	-	-
St. Thomas	-	-	-	-	4	4
Portland	-	-	-	-	5	5
St. Mary	-	-	3	1	122	61
St Ann	-	-	0	0	118	7
Trelawny	2	1	0	0	18	5
ST. James	-	-	-	-	3	3
Hanover	5	5	16	3	18	2
Westmoreland	0	0	2	1	95	12
St. Elizabeth	1	0	7	1	108	9
Manchester	1	1	-	-	52	26
Clarendon	7	1	3	1	0	0
St. Catherine	2	0	6	1	119	30
ALL	18	1	37	1	662	11

BEEF CATTLE SURVEY - 2005

APPENDIX 7c

Distribution of steers by parish and size class

PARISH	SIZE CLASS					
	Small		Medium		Large	
	NO.	MEAN	NO.	MEAN	NO.	MEAN
No Response	0	0	-	-	-	-
St. Thomas	-	-	-	-	27	27
Portland	-	-	-	-	0	0
St. Mary	-	-	55	14	0	0
St Ann	-	-	0	0	63	4
Trelawny	0	0	0	0	26	7
ST. James	-	-	-	-	0	0
Hanover	0	0	5	1	15	2
Westmoreland	0	0	0	0	0	0
St. Elizabeth	0	0	15	1	100	8
Manchester	0	0	-	-	57	57
Clarendon	0	0	100	25	0	0
St. Catherine	0	0	0	0	0	0
ALL	0	0	175	4	288	5

BEEF CATTLE SURVEY - 2005

APPENDIX 7d

Distribution of heifers by parish and size class

PARISH	SIZE CLASS					
	Small		Medium		Large	
	NO.	MEAN	NO.	MEAN	NO.	MEAN
No Response	0	0	-	-	-	-
St. Thomas	-	-	-	-	76	76
Portland	-	-	-	-	71	71
St. Mary	-	-	9	2	116	58
St Ann	-	-	0	0	699	41
Trelawny	6	3	5	3	124	31
ST. James	-	-	-	-	31	31
Hanover	1	1	46	8	200	25
Westmoreland	0	0	13	3	594	74
St. Elizabeth	4	1	77	6	624	52
Manchester	2	2	-	-	304	152
Clarendon	60	6	117	29	22	22
St. Catherine	17	2	30	5	451	113
ALL	90	3	297	7	3312	54

BEEF CATTLE SURVEY - 2005

APPENDIX 7e

Distribution of young bulls by parish and size class

PARISH	SIZE CLASS					
	Small		Medium		Large	
	NO.	MEAN	NO.	MEAN	NO.	MEAN
No Response	50	50	-	-	-	-
St. Thomas	-	-	-	-	2	2
Portland	-	-	-	-	19	19
St. Mary	-	-	0	0	8	4
St Ann	-	-	0	0	179	11
Trelawny	0	0	1	1	20	5
ST. James	-	-	-	-	8	8
Hanover	0	0	11	2	173	22
Westmoreland	0	0	3	1	257	32
St. Elizabeth	0	0	45	3	95	8
Manchester	1	1	-	-	63	63
Clarendon	28	3	110	28	0	0
St. Catherine	6	1	19	3	731	183
ALL	85	3	189	5	1555	26

BEEF CATTLE SURVEY - 2005

APPENDIX 7f

Distribution of cow calves by parish and size class

PARISH	SIZE CLASS					
	Small		Medium		Large	
	NO.	MEAN	NO.	MEAN	NO.	MEAN
No Response	0	0	-	-	-	-
St. Thomas	-	-	-	-	51	51
Portland	-	-	-	-	7	7
St. Mary	-	-	4	1	72	36
St Ann	-	-	1	1	661	39
Trelawny	4	2	2	1	170	43
ST. James	-	-	-	-	25	25
Hanover	0	0	30	5	142	18
Westmoreland	0	0	14	4	340	43
St. Elizabeth	1	0	41	3	992	83
Manchester	0	0	-	-	96	48
Clarendon	39	4	5	1	7	7
St. Catherine	15	2	33	6	42	11
ALL	59	2	130	3	2605	43

BEEF CATTLE SURVEY - 2005

APPENDIX 7g

Distribution of bull calves by parish and size class

PARISH	SIZE CLASS					
	Small		Medium		Large	
	NO.	MEAN	NO.	MEAN	NO.	MEAN
No Response	0	0	-	-	-	-
St. Thomas	-	-	-	-	51	51
Portland	-	-	-	-	7	7
St. Mary	-	-	3	1	69	35
St Ann	-	-	1	1	564	33
Trelawny	1	1	2	1	173	43
ST. James	-	-	-	-	28	28
Hanover	0	0	28	5	159	20
Westmoreland	1	1	13	3	368	46
St. Elizabeth	4	1	49	4	647	54
Manchester	0	0	-	-	80	40
Clarendon	26	3	4	1	7	7
St. Catherine	6	1	30	5	29	7
ALL	38	1	130	3	2182	36

BEEF CATTLE SURVEY - 2005

APPENDIX 8

Distribution of persons employed by size class and sex of employees

SIZE CLASS	SEX OF EMPLOYEES	
	Male	Female
Small	11	1
Medium	64	3
Large	471	68
ALL	546	72

BEEF CATTLE SURVEY - 2005

APPENDIX 9

Distribution of farmers by feeding systems and size class

FEEDING SYSTEM	CLASS SIZE							
	Small		Medium		Large		ALL	
	N	%	N	%	N	%	N	%
Pasture Only	17	13.3	32	25.0	43	33.6	92	71.9
Zero-Grazing	2	1.6	2	1.6	8	6.3	12	9.4
Concentrate	4	3.1	6	4.7	11	8.6	21	16.4
By Products	1	0.8	5	3.9	6	4.7	12	9.4
Other	3	2.3	1	0.8	2	1.6	6	4.7

BEEF CATTLE SURVEY - 2005

APPENDIX 10

Total and average number of animals disposed of by size class

TYPE OF ANIMAL	SIZE CLASS					
	Small		Medium		Large	
	NO.	AVG.	NO.	AVG.	NO.	AVG.
Cows	84	9	58	4	658	25
Heifers	20	5	12	3	479	30
Bulls	28	2	75	5	246	12
Steers	-	-	7	4	212	24
Calves - Male	-	-	-	-	455	28
Calves - Female	-	-	-	-	288	24
ALL	132	5	152	4	2,338	24

BEEF CATTLE SURVEY - 2005

APPENDIX 11

Distribution of farmers by equipment employed and class size

EQUIPMENT EMPLOYED	CLASS SIZE							
	Small		Medium		Large		ALL	
	N	%	N	%	N	%	N	%
Feed Silo (bin)	-	-	2	1.6	6	4.7	8	6.3
Standby Generator	-	-	3	2.3	14	10.9	17	13.3
Tractor for Tillage	-	-	13	10.2	39	30.5	52	40.6
Hay/Silage Making Equipment	-	-	1	0.8	6	4.7	7	5.5

BEEF CATTLE SURVEY - 2005

APPENDIX 12

Distribution of farmers by type of spraying equipment and class size

SPRAYING EQUIPMENT	CLASS SIZE							
	Small		Medium		Large		ALL	
	N	%	N	%	N	%	N	%
Spray Race	-	-	-	-	18	14.1	18	14.1
Dip	-	-	2	1.6	8	6.3	10	7.8
Mist Blower	2	1.6	4	3.1	16	12.5	22	17.2
Hand Pump	17	13.3	34	26.6	25	19.5	76	59.4

BEEF CATTLE SURVEY - 2005

APPENDIX 13

Distribution of farmers by irrigation source and class size

IRRIGATION SOURCE	CLASS SIZE							
	Small		Medium		Large		ALL	
	N	%	N	%	N	%	N	%
Own Well	-	-	2	1.6	11	8.6	13	10.2
NIC	1	0.8	6	4.7	2	1.6	9	7.0
River	-	-	-	-	7	5.5	7	5.5
Pond	-	-	1	0.8	7	5.5	8	6.3
None	15	11.7	24	18.8	21	16.4	60	46.9
Morass	-	-	1	0.8	-	-	1	0.8

BEEF CATTLE SURVEY - 2005

APPENDIX 14

Distribution of farmers by irrigation method and class size

IRRIGATION METHOD	CLASS SIZE							
	Small		Medium		Large		ALL	
	N	%	N	%	N	%	N	%
Sprinkler System	1	0.8	4	3.1	5	3.9	10	7.8
Flood	-	-	2	1.6	-	-	2	1.6
Relift Pump	-	-	3	2.3	4	3.1	7	5.5
Pressured Water	-	-	2	1.6	4	3.1	6	4.7
Other	-	-	-	-	1	0.8	1	0.8

BEEF CATTLE SURVEY - 2005

APPENDIX 15

Distribution of farmers by technical input that mostly limits productivity

TECHNICAL INPUT	No.	%
No Response	24	18.8
Fertilizer rates and general pasture management	57	44.5
Level of supplementary feeding to herd	20	15.6
Herd fertlity	7	5.5
Other	27	21.1

BEEF CATTLE SURVEY - 2005

APPENDIX 16

Distribution of farmers by major cause for decline in the demand for local beef

MAJOR CAUSE	No.	%
No Response	12	9.4
Cost of local beef to the consumer	7	5.5
Government's policy on beef imports	84	65.6
Changing consumer tastes	19	14.8
Other	21	16.4

BEEF CATTLE SURVEY - 2005

APPENDIX 17

Distribution of farmers by main cause for high cost of beef to consumers

MAIN CAUSE	No.	%
No Response	14	11.0
Level of technology applied on farms	6	4.7
High margins taken by butchers	75	59.1
High margins taken by retailers	51	40.2
Other	28	22.0

BEEF CATTLE SURVEY - 2005

APPENDIX 18

Distribution of farmers by what they consider to be a fair lease value for their farmland

LEASE VALUE	No.	%
No Response	36	28.1
Below $500 per acre	33	25.8
$501 - $999 per acre	20	15.6
$1,000 - $2,000 per acr	23	18.0
Other	16	12.5

BEEF CATTLE SURVEY - 2005

APPENDIX 19

Distribution of farmers by opinion on how beef farmers can secure a larger share of consumers' dollar

OPINION	No.	%
No Response	18	14.1
Individual farmers getting into feedlotting	6	4.7
Farmers groups establishing feedlots and small abattoirs	12	9.4
Establishing a central certified abattoir in which farmers are shareholders	76	59.4
Other	25	19.5

BEEF CATTLE SURVEY - 2005

APPENDIX 20

Distribution of farmers by personal strategy for coping with droughts

PERSONAL STRATEGY	No.	%
No Response	16	12.5
Feed sugar cane residues	46	35.9
Feed hay, silage, haylages etc	13	10.2
Feed by products	34	26.6
Other	44	34.4

BEEF CATTLE SURVEY - 2005

APPENDIX 21

Distribution of farmers by opinion on how Government can best assist local beef/(dairy) farmers

OPINION	No.	%
No Response	14	10.9
More focussed research into technical problems faced by cattle farmers	17	13.3
Reduced interest rates on farm loans	71	55.5
Increased duties on imported beef/(dairy) products	61	47.7
Other	17	13.3

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 22

Distribution of farms by parish and size class

PARISH	SIZE CLASS	
	Large	TOTAL
St. Thomas	1	1
Portland	1	1
St. Mary	1	1
St Ann	12	12
Trelawny	4	4
ST. James	1	1
Hanover	2	2
Westmoreland	4	4
St. Elizabeth	9	9
Manchester	2	2
Clarendon	1	1
St. Catherine	2	2
ALL ISLAND	40	40

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 23

Farm size (ac) by size class

SIZE CLASS	TOTAL FARM SIZE (ac)	MEAN FARM SIZE (ac)
Large	44,395.00	1109.88
ALL	44,395.00	1109.88

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 24a

Acreage in pasture by size class

SIZE CLASS	TOTAL ACREAGE IN PASTURE	MEAN ACREAGE IN PASTURE	PERCENTAGE IN PASTURE
Large	25,644.00	641.10	57.8
ALL	25,644.00	641.10	57.8

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 24b

Acreage in pasture by parish and size class

PARISH	SIZE CLASS	
	Large	ALL
St. Thomas	350.00	350.00
Portland	800.00	800.00
St. Mary	630.00	630.00
St Ann	8,893.00	8,893.00
Trelawny	3,092.00	3,092.00
ST. James	450.00	450.00
Hanover	290.00	290.00
Westmoreland	2,350.00	2,350.00
St. Elizabeth	6,071.00	6,071.00
Manchester	2,200.00	2,200.00
Clarendon	200.00	200.00
St. Catherine	318.00	318.00
ALL	25,644.00	25,644.00

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 25

Acreage in improved pasture by size class

SIZE CLASS	TOTAL ACREAGE IN IMPROVED PASTURE	MEAN ACREAGE IN IMPROVED PASTURE
Large	13,672.00	402.12
ALL	13,672.00	402.12

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 25a

Mean acreage in improved pasture by type of pasture and size class

TYPE OF PASTURE	SIZE CLASS	
	Large	ALL
African Star	301.25	301.25
Pangola	140.58	140.58
Guinea	101.94	101.94
Tifton	0.00	0.00
Bracharia	196.27	196.27
Other	160.75	160.75

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 26b

Acreage in improved pasture by type of pasture and size class

TYPE OF PASTURE	SIZE CLASS			
	Large		ALL	
	Amount (ac)	% of improved pasture	Amount (ac)	% of improved pasture
African Star	9,640.00	70.5	9,640.00	70.5
Pangola	1,687.00	12.3	1,687.00	12.3
Guinea	1,631.00	11.9	1,631.00	11.9
Tifton	0.00	0.0	0.00	0.0
Bracharia	2,944.00	21.5	2,944.00	21.5
Other	2,572.00	18.8	2,572.00	18.8

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 27

Distribution of farmers by size class and gender

SIZE CLASS	GENDER			
	N/A	Male	Female	ALL
Large	23	15	2	40
ALL	23	15	2	40

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 28a

Distribution of cows by parish and size class

PARISH	SIZE CLASS									
	Large									
	J. Red		J. Braham		J. Black		Other		Total	
	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN
St. Thomas	29	29	48	48	-	-	45	45	122	122
Portland	137	137	-	-	-	-	-	-	137	137
St. Mary	90	90	70	70	20	20	65	65	245	245
St Ann	1369	114	146	146	362	91	220	110	2097	175
Trelawny	321	80	36	36	-	-	117	59	474	119
ST. James	-	-	83	83	-	-	-	-	83	83
Hanover	50	25	-	-	-	-	-	-	50	25
Westmoreland	686	229	15	15	12	12	143	72	856	214
St. Elizabeth	723	80	417	139	80	40	86	43	1306	145
Manchester	418	209	50	50	-	-	80	80	548	274
Clarendon	-	-	80	80	-	-	-	-	80	80
St. Catherine	-	-	93	93	36	36	-	-	129	65
ALL	3823	109	1038	87	510	57	756	69	6127	153

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
TABLE APPENDIX 28b

Distribution of bulls by parish and size class

PARISH	SIZE CLASS									
	Large									
	J. Red		J. Braham		J. Black		Other		Total	
	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN
St. Thomas	2	2	2	2	-	-	-	-	4	4
Portland	5	5	-	-	-	-	-	-	5	5
St. Mary	6	6	3	3	-	-	108	108	117	117
St Ann	57	6	9	9	18	5	9	5	93	8
Trelawny	13	4	2	2	1	1	2	1	18	5
ST. James	-	-	3	3	-	-	-	-	3	3
Hanover	3	2	-	-	-	-	-	-	3	2
Westmoreland	7	2	3	2	1	1	25	25	36	9
St. Elizabeth	54	6	27	14	5	3	-	-	86	10
Manchester	37	19	2	1	6	6	5	5	52	26
Clarendon	-	-	-	-	-	-	-	-	0	0
St. Catherine	-	-	6	6	3	3	-	-	9	5
ALL	184	6	57	5	34	3	149	21	426	11

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 28c

Distribution of steers by parish and size class

PARISH	SIZE CLASS									
	Large									
	J. Red		J. Braham		J. Black		Other		Total	
	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN
St. Thomas	5	5	14	14	-	-	8	8	27	27
Portland	-	-	-	-	-	-	-	-	0	0
St. Mary	-	-	-	-	-	-	-	-	0	0
St Ann	58	12	-	-	5	5	-	-	63	5
Trelawny	16	16	6	6	-	-	4	4	26	7
ST. James	-	-	-	-	-	-	-	-	0	0
Hanover	-	-	-	-	-	-	-	-	0	0
Westmoreland	-	-	-	-	-	-	-	-	0	0
St. Elizabeth	-	-	-	-	-	-	-	-	0	0
Manchester	20	20	-	-	-	-	37	37	57	57
Clarendon	-	-	-	-	-	-	-	-	0	0
St. Catherine	-	-	-	-	-	-	-	-	0	0
ALL	99	12	20	10	5	5	49	16	173	4

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 28d

Distribution of heifers by parish and size class

PARISH	SIZE CLASS									
	Large									
	J. Red		J. Braham		J. Black		Other		Total	
	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN
St. Thomas	18	18	30	30	-	-	28	28	76	76
Portland	71	71	-	-	-	-	-	-	71	71
St. Mary	53	53	41	41	12	12	-	-	106	106
St Ann	358	40	47	47	72	24	122	41	599	50
Trelawny	69	23	28	28	-	-	27	9	124	31
ST. James	-	-	31	31	-	-	-	-	31	31
Hanover	30	15	-	-	-	-	-	-	30	15
Westmoreland	12	6	6	6	-	-	246	82	264	66
St. Elizabeth	251	28	123	62	30	15	6	6	410	46
Manchester	207	104	28	14	-	-	69	69	304	152
Clarendon	-	-	22	22	-	-	-	-	22	22
St. Catherine	-	-	29	29	22	22	-	-	51	26
ALL	1069	36	385	32	136	19	498	42	2088	52

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 28e

Distribution of young bulls by parish and size class

PARISH	SIZE CLASS									
	Large									
	J. Red		J. Braham		J. Black		Other		Total	
	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN
St. Thomas	2	2	-	-	-	-	-	-	2	2
Portland	19	19	-	-	-	-	-	-	19	19
St. Mary	3	3	3	3	-	-	-	-	6	6
St Ann	32	6	11	11	24	8	-	-	67	6
Trelawny	16	5	2	2	-	-	2	2	20	5
ST. James	-	-	8	8	-	-	-	-	8	8
Hanover	3	3	-	-	-	-	-	-	3	2
Westmoreland	27	14	3	3	-	-	27	9	57	14
St. Elizabeth	84	14	4	4	3	3	-	-	91	10
Manchester	55	55	6	6	2	2	-	-	63	63
Clarendon	-	-	-	-	-	-	-	-	0	0
St. Catherine	-	-	11	11	-	-	-	-	11	6
ALL	241	11	48	6	29	6	29	7	347	9

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 28f

Distribution of cow calves by parish and size class

PARISH	SIZE CLASS	
	Large	
	NO.	MEAN
St. Thomas	51	51
Portland	7	7
St. Mary	35	35
St Ann	478	40
Trelawny	170	43
ST. James	25	25
Hanover	15	8
Westmoreland	228	57
St. Elizabeth	828	92
Manchester	96	48
Clarendon	7	7
St. Catherine	42	21
ALL	1982	50

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 28g

Distribution of bull calves by parish and size class

PARISH	SIZE CLASS									
	Large									
	J. Red		J. Braham		J. Black		Other		Total	
	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN	NO.	MEAN
St. Thomas	10	10	14	14	-	-	27	27	51	51
Portland	7	7	-	-	-	-	-	-	7	7
St. Mary	-	-	-	-	-	-	34	34	34	34
St Ann	227	25	32	32	77	19	108	36	444	37
Trelawny	102	34	22	22	-	-	49	16	173	43
ST. James	-	-	28	28	-	-	-	-	28	28
Hanover	15	8	-	-	-	-	-	-	15	8
Westmoreland	27	14	6	6	-	-	208	69	241	60
St. Elizabeth	163	23	17	17	-	-	333	111	513	57
Manchester	67	34	13	13	-	-	-	-	80	40
Clarendon	-	-	7	7	-	-	-	-	7	7
St. Catherine	-	-	27	27	2	2	-	-	29	15
ALL	618	23	166	18	79	16	759	54	1622	41

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 28h

Breakdown of herds held by breed society members

CLASS	J. Red	J. Braham	J. Black	Other	Total
Cows	3,823	1,038	510	756	6,127
Bulls	184	57	34	149	426
Steers	99	20	5	49	173
Heifers	1,069	385	136	498	2,088
Young Bulls	241	98	29	29	397
Cow calves	720	156	89	1,017	1,982
Bull calves	618	166	79	759	1,622
ALL	6,754	1,920	882	3,257	12,815

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 29

Distribution of persons employed by size class and sex of employees

SIZE CLASS	SEX OF EMPLOYEES	
	Male	Female
Large	354	62
ALL	354	62

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 30

Distribution of farmers by feeding systems and size class

FEEDING SYSTEM	CLASS SIZE			
	Large		ALL	
	N	%	N	%
Pasture Only	30	75.0	30	75.0
Zero-Grazing	8	20.0	8	20.0
Concentrate	10	25.0	10	25.0
By Products	3	7.5	3	7.5
Other	2	5.0	2	5.0

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 31

Total and average number of animals disposed of by size class

TYPE OF ANIMAL	SIZE CLASS	
	Large	
	NO.	AVG.
Cows	570	29
Heifers	438	37
Bulls	184	12
Steers	182	23
Calves - Male	385	30
Calves - Female	263	24
ALL	2,022	26

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 32

Distribution of farmers by equipment employed and class size

EQUIPMENT EMPLOYED	CLASS SIZE			
	Large		ALL	
	N	%	N	%
Feed Silo (bin)	3	7.5	3	7.5
Standby Generator	8	20.0	8	20.0
Tractor for Tillage	29	72.5	29	72.5
Hay/Silage Making Equipment	4	10.0	4	10.0

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 33

Distribution of farmers by type of spraying equipment and class size

SPRAYING EQUIPMENT	CLASS SIZE			
	Large		ALL	
	N	%	N	%
Spray Race	14	35.0	14	35.0
Dip	7	17.5	7	17.5
Mist Blower	10	25.0	10	25.0
Hand Pump	16	40.0	16	40.0

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 34

Distribution of farmers by irrigation source and class size

IRRIGATION SOURCE	CLASS SIZE			
	Large		ALL	
	N	%	N	%
Own Well	8	20.0	8	20.0
NIC	2	5.0	2	5.0
River	7	17.5	7	17.5
Pond	5	12.5	5	12.5
None	13	32.5	13	32.5
Morass	-	-	-	-

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 35

Distribution of farmers by irrigation method and class size

IRRIGATION METHOD	CLASS SIZE			
	Large		ALL	
	N	%	N	%
Sprinkler System	5	12.5	5	12.5
Flood	-	-	-	-
Relift Pump	4	10.0	4	10.0
Pressured Water	4	10.0	4	10.0
Other	-	-	-	-

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 36

Distribution of farmers by technical input that mostly limits productivity

TECHNICAL INPUT	No.	%
No Response	5	12.5
Fertilizer rates and general pasture management	26	65.0
Level of supplementary feeding to herd	4	10.0
Herd fertlity	3	7.5
Other	7	17.5

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 37

Distribution of farmers by major cause for decline in the demand for local beef

MAJOR CAUSE	No.	%
No Response	4	10.0
Cost of local beef to the consumer	5	12.5
Government's policy on beef imports	28	70.0
Changing consumer tastes	9	22.5
Other	5	12.5

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 38

Distribution of farmers by main cause for high cost of beef to consumers

MAIN CAUSE	No.	%
No Response	4	10.0
Level of technology applied on farms	2	5.0
High margins taken by butchers	26	65.0
High margins taken by retailers	23	57.5
Other	6	15.0

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 39

Distribution of farmers by what they consider to be a fair lease value for their farmland

LEASE VALUE	No.	%
No Response	8	20.0
Below $500 per acre	10	25.0
$501 - $999 per acre	10	25.0
$1,000 - $2,000 per acr	8	20.0
Other	4	10.0

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 40

Distribution of farmers by opinion on how beef farmers can secure a larger share of consumers' dollar

OPINION	No.	%
No Response	6	15.0
Individual farmers getting into feedlotting	3	7.5
Farmers groups establishing feedlots and small abattoirs	10	25.0
Establishing a central certified abattoir in which farmers are shareholders	23	57.5
Other	5	12.5

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 41

Distribution of farmers by personal strategy for coping with droughts

PERSONAL STRATEGY	No.	%
No Response	4	10.0
Feed sugar cane residues	8	20.0
Feed hay, silage, haylages etc	6	15.0
Feed by products	12	30.0
Other	16	40.0

BEEF CATTLE SURVEY - 2005
PURE BREEDERS
APPENDIX 42

Distribution of farmers by opinion on how Government can best assist local beef/(dairy) farmers

OPINION	No.	%
No Response	5	12.5
More focussed research into technical problems faced by cattle farmers	10	25.0
Reduced interest rates on farm loans	19	47.5
Increased duties on imported beef/(dairy) products	17	42.5
Other	12	30.0