# JDDB DISCUSSION PAPER

# A Perspective on the Jamaican Dairy Industry: Challenges for the Jamaica Dairy Development Board

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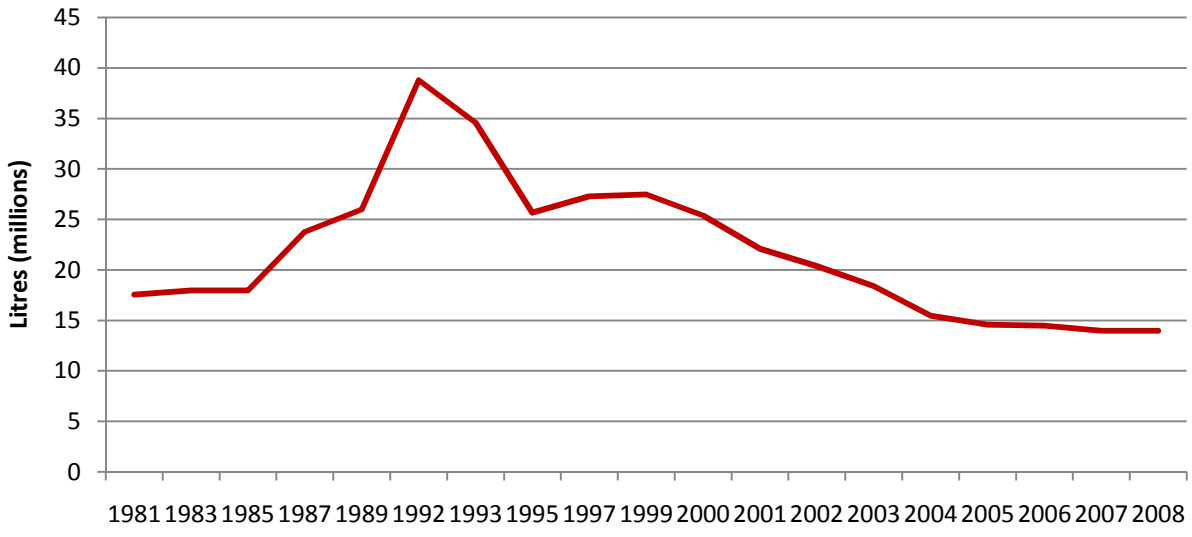
## Introduction

The volatility of the food and commodities market experienced over the past two years has clearly exposed the nutritional vulnerability of large swaths of the Jamaican population. It has also highlighted the need for a reorientation of national food and nutrition policy away from its historical heavy dependence on importation of 'cheap' food, to a policy of increasing self-reliance. The current global recession forces a rethink of the issue of national food security from the mere economic concepts of access and affordability, toward a higher order 'Food Sovereignty', which embraces the additional challenges of livelihood protection and wealth creation within a global reality which demands international competitiveness.

The local dairy industry, perhaps more than any other agricultural subsector, presents a case study of the negative consequences of *laissez faire* trade liberalization on the domestic economy. The causes and effects have been the subject of several reviews including Duffus and Jennings, 2005; Jennings, 2002, 2005, 2007, 2008 and Kirton and Witter 2006; the last, a study of the impact of import surges commissioned by the FAO. Figure 1 below captures graphically, the fortunes of the local dairy sector over much of the past three decades; the major inflection point reflecting the abrupt shift in policy to trade liberalization in 1992.

**Fig 1: Local Fresh Milk Production 1981-2008**



The policy shift to one of a market-determined economic portfolio coincided with the effort at reducing the butter mountain within the European Union and effectively, the dumping of whole milk powder on developing country markets. A case successfully argued by local dairy farmers and upheld by the then Anti-Dumping Advisory Committee in 1995, established that whole milk powder entering Jamaica from the EU, enjoyed subsidies amounting to 78 percent of the domestic price of this product at origin. The recommendation of a countervailing duty of 137 percent was never implemented on the basis of its likely inflationary impact on the poor. Incremental imports of milk powder in 1993, were equivalent to approximately 21.9 million litres or 56.4 percent of total fresh milk production in 1992 (Jennings, 2005). The domestic milk producing sector was never able to recover from this level of trade distortion, with the consequence that more than 550 small and medium sized farmers were forced out of the market between 1990 and 2004 (Jennings et al, 2004).

Perhaps even more devastating was the simultaneous significant disinvestment which took place at ALCAN Jamaica Company and Serge Island which together had accounted for approximately 35 percent of domestic milk production prior to trade liberalization (Jennings, 2008). Milk production at ALCAN (now WINDALCO) fell from a peak of approximately 6.6 million litres in 1992 and has not exceeded 3.5 million during the past five years. The recent suspension of mining and alumina production at WINDALCO has been followed by a new round of sub-optimal milk production with potential severe consequences for any effort at increasing national production, given that WINDALCO in 2008 accounted for approximately 23 percent of local milk production. The 7.2 million litres produced at Serge Island in 1992 remains an immediate challenge to the new owners, SEPROD; production having fallen to below 5 million litres immediately prior to the change of ownership in 2006. Recent investments in additional productive capacity at Serge Island, provide a well need confidence booster to an embattled sector.

## Rationale for an Expanded Domestic Milk Producing Sector

The upheavals in the world dairy market since 2006, marked by exponential increases in the international prices of milk solids, have been long in the making given the intractable deficit between rates of growth in production among main producing countries (1.5% p.a.) and global demand (1.6% p.a.) (Table 1). The more immediate causes of the price hikes were:

1. The removal of export rebates on milk solids within the EU commencing in the summer of 2006 and concluded in 2007, only to be reinstated in February 2009 in the face of a free-fall in prices;

2. The pressure on world supplies caused by changing dietary habits among the newly-industrialized countries, led by China, which registered an annual

demand growth of 18 percent outstripping world demand growth by a factor of 11.

3. The impact on production costs resulting from escalations in grain prices from increasing diversion of feed grains to bio-fuel, led by a 93 percent increase in corn prices between 2006 and 2007;

4. Manipulation of the product mixes by manufacturers, to maximize profit taking;

5. The prolonged fiscal deficits in the US economy which effectively resulted in a serial devaluation of the US dollar against the currencies of its major trading partners.

Increasing dairy production in Brazil, India and China, in tandem with the global recession commencing in 2008, have dampened demand for imports to the extent that prices fell from 2007 peaks of US$5500 and $5800 per ton, respectively, for skimmed milk powder and cheddar to corresponding lows of US$1900 and $2200 per ton in 2009. This prompted a reinstatement of export rebates by the EU since February 2009. It is the informed consensus that this forebodes a prolonged period of market instability given the intractable demand/ supply gap and the increasing exodus of many of the smaller European and North American farmers.

The structural deficit between global milk production and consumption and the increasing threat to an already fragile environment in many of the major producing countries, pose serious concerns regarding the sustainability of an import based policy in developing countries such as Jamaica. The *Agricultural Outlook 2009-2018,* a joint OECD/FAO publication essentially forewarns of the imperative of a shift in the production of agricultural commodities – other than wheat and coarse grains – increasingly away from developed to developing countries as a strategy toward global food security. On a longer term basis it has been projected that global food production will need to increase more than 40 percent by 2030 and 70 percent by 2050 compared to output during the 2005-2007 period (FAO 2009). Critically, the Latin American and Caribbean region, with its potential for rain fed agriculture, is postulated as one of the new centres of agricultural growth.

**Table 1**. Dairy: World Supply vs. Demand 1999 – 2008
(Expressed in fluid equivalents – $t.10^3$)

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Fluid Milk** | | | | | | | | | | |
| **Pro**duction (main producing countries) | 378117 | 382406 | 386214 | 393461 | 394119 | 401448 | 410028 | 418846 | 427817 | 435101 |
| Consumption *in situ* | 151406 | 152293 | 153030 | 152608 | 153849 | 155367 | 159311 | 163903 | 160960 | 162795 |
| Production - China | n/a | n/a | 10,255 | 12,998 | 17,463 | 22,606 | 27,534 | 31,934 | 35,252 | 36,700 |
| **Cheese** | | | | | | | | | | |
| Production (+ inventories) | 122960 | 128090 | 128900 | 133770 | 133340 | 136750 | 140520 | 143810 | 141360 | 143600 |
| Consumption (incl. Exports) | 124500 | 129210 | 131900 | 135570 | 137280 | 140990 | 145200 | 148580 | 151720 | 153020 |
| **Butter/Butter Oil** | | | | | | | | | | |
| Production | 46,512 | 48,104 | 50,656 | *55,032* | *54,880* | *55,672* | *56,544* | *58,672* | *59,320* | 62,184 |
| Consumption (incl. Exports) | 45,632 | 48,184 | 51,272 | *53,584* | *54,528* | *56,776* | *56,496* | *59,024* | *62,944* | 64,972 |
| **Skimmed milk powder** | | | | | | | | | | |
| Production | 41,206 | 43,076 | 44,957 | 50,347 | 48,994 | 40,722 | 38,137 | 37,213 | 35,750 | 36,938 |
| Consumption (incl. Exports) | 44,429 | 45,507 | 43,461 | 46,684 | 49,775 | 46,739 | 44,660 | 42,097 | 43,219 | 43,890 |
| **Whole milk powder** | | | | | | | | | | |
| Production | 24,232 | 25,136 | 25,904 | 26,696 | 26,616 | 28,408 | 28,912 | 29,520 | 29,368 | 30,968 |
| Consumption (incl. Exports) | 28,024 | 28,320 | 30,408 | 30,440 | 31,096 | 29,544 | 29,288 | 30,336 | 31,048 | 31,688 |
| **Consumption of Fluid milk & Major Solids** | | | | | | | | | | |
| Total Consumption (World) | 393991 | 403514 | 410071 | 418886 | 426528 | 429416 | 434955 | 443940 | 449891 | 456185 |
| " " (China) | n/a | n/a | 10,295 | 11,863 | 15,692 | 18,896 | 21,373 | 23,653 | 24,950 | 25,700 |
| **Ave SMP price – High FOB ex EU (US$/mt)*** | | | | | | | | | | |
| | 1,374 | 1,964 | 2,091 | 1,406 | 1,782 | 2,034 | 2,320 | 2,598 | 4,586 | 3,380 |
| **Jamaican Expenditure on Dairy Imports (US$ M)**** | | | | | | | | | | |
| | 33.5 | 33.3 | 48.3 | 38.9 | 39.1 | 47.5 | 52.6 | 39.7 | 59.5 | 60.1 |

Sources: USDA-FAS; *USDA – AMS; **JDDB, Dairy Facts & Figures

The near-doubling in foreign exchange expenditure during the decade ending 2008, to approximately US$60 million (Table 1), provides an additional compelling reason for an expanded domestic milk producing sector. It has been calculated that the 2007 expenditure on local beef and dairy imports (US$70.62 million) represents foregone investment opportunity in productive capacity for an incremental 122.4 million litres of milk per annum (JDDB/BDPAJ, 2009).

Jamaica, among its CARICOM partners, is uniquely equipped to tackle the challenge of meeting domestic and regional demand for milk and dairy products on the basis of:

i. **Land Resources**: With respect to land capability, approximately 51 percent of Agricultural land has been classified as best suited to the production of improved pasture (CRIES 1982). Notwithstanding the need for an updated land inventory, availability of land in no way poses a physical limitation to significantly increased milk production;

ii. **Animal Genetic Resources**: The Jamaica Hope, notwithstanding its reduced current population (app. 7000 breeding females) remains a critical platform for revitalization of the dairy sector. Current levels of production indicate that animals are under-performing by as much as 30-35 percent relative to established genetic potential ( Holness *et al,* 1994);

iii. **Knowledge Resources**: A significant body of information derived from local and regional research over the past 60 years, is available for transforming the local dairy sector into a viable, internationally competitive contributor to local wealth creation. Testament to this is the achievement of levels of output in excess of 13,500 litres of milk per hectare from Jamaica Hope cows at Serge Island (Jennings and Clayton, 1995); equivalent to a gross per hectare return of approximately $607,500 at current farm gate prices.

## The State of Competitiveness of Local Milk Production

The unprecedented prices for internationally traded milk solids in 2007 and 2008 provided a missed window of opportunity for the local dairy sector to expand market share. The impact of these increases on the local consumer was seen in a 48 percent increase in the retail price of an 80gm sachet of whole milk powder between June ($47.58) and December 2007 ($70.60). This effectively narrowed the fluid equivalent price advantage for this substitute, relative to pasteurized milk, from $35.66 to $5.22 per litre.

The failure, by the local sector, to appreciate and exploit the increased consumer price indifference, was evidenced in a 59 percent increase in farm gate prices between first quarter of fiscal 2007 and final quarter of 2008 when average farm gate price stood at $45.39 per litre. At the retail end this translated into an even more egregious 65 percent increase over the two year period. Effectively the import trade has been allowed to significantly increase their margins by maintaining retail price levels in spite of significant reductions in quoted FOB prices of milk solids. As at June 2009, the price advantage to imported whole milk powder had increased to $87.26 per litre-equivalent relative to locally produced milk.

The foregoing, which has been conditioned by the fickleness of the Common Agricultural Policy of the European Union, highlights the difficulties facing countries such as Jamaica in achieving price-competitiveness in the domestic production of milk. It also highlights the critical importance of product differentiation as a competitive strategy for sustainable dairy development.

Table 2 highlights the challenges of pursuing a purely cost focus in achieving sustainable competitiveness in local milk production.

**Table 2**. International Cost Competitiveness of Locally Produced Milk (US$/Litre)

| | Farm gate price | Cost of Production | Ave. Wage Level (US$/hr) | Labour Productivity (Litres/hr) |
|---|---|---|---|---|
| New Zealand | 0.20 | 0.14 | 8.0 | 288 |
| Argentina | 0.16 | 0.07 | 3.0 | 86 |
| Poland | 0.25 | 0.07 | 3.0 | 35 |
| Australia | 0.23 | 0.16 | 13.0 | 289 |
| United Kingdom | 0.37 | 0.23 | 16.0 | 197 |
| **Jamaica (2005)** | **0.36** | **0.35** | **2.20** | **9.25** |

Source: Jennings 2007

The comparatively low level of labour productivity on Jamaican dairy farms, while pointing to the need to increase competency levels, is also a function of differential levels of applied technology as well as suboptimal returns to Jamaican labour.

Table 3 (adapted from Ffrench *et al*, 2009) summarizes the changes in the cost competitiveness of milk in Jamaica over the past five years, as indicated by the JDDB annual cost of production survey. It also highlights the difficulties of maintaining cost competitiveness in an enterprise highly dependent upon imported inputs.

**Table 3**. Cost/price comparison Jamaica vs. USA (US$/Litre)

| | 2004 | 2005 | 2006 | 2007 | 2008 | 5-Yr. Ave |
|---|---|---|---|---|---|---|
| Ave. var. Cost - Ja | 0.31 | 0.35 | 0.36 | 0.44 | 0.53 | 0.40 |
| " " " - USA | 0.23 | 0.25 | 0.26 | 0.30 | 0.36 | 0.28 |
| Farm gate price – Ja | 0.33 | 0.36 | 0.39 | 0.41 | 0.57 | 0.41 |
| " " " - USA | 0.35 | 0.34 | 0.29 | 0.43 | 0.41 | 0.36 |
| Retail price – Jamaica | 1.16 | 1.20 | 1.23 | 1.71 | 1.98 | 1.46 |
| Retail price - USA | 0.83 | 0.84 | 0.81 | 0.92 | 1.00 | 0.88 |

The following are worth noting:

a) On average, Jamaican farmers had a 43 percent disadvantage in variable production costs compared to their US counterparts between 2004 and 2008;

b) US farmers enjoyed an average gross margin of 28.5 percent compared to 2.5 percent by Jamaican farmers during the same period;

c) Price competitiveness within the US market was maintained by an apparent restraint on retail margins which averaged 141 percent above farm gate compared to 255 percent in the Jamaican market, underutilized processing capacity playing a large role in the high margins taken in the local dairy chain.

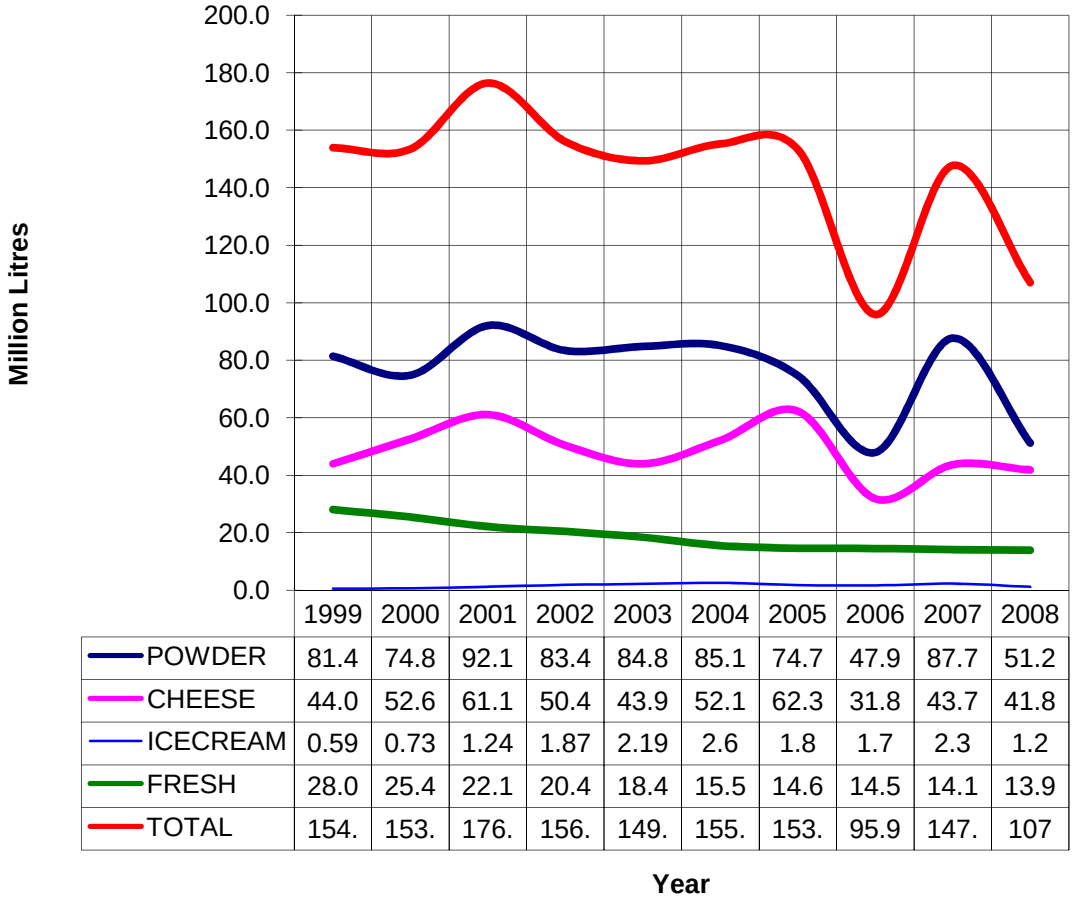
The foregoing speaks to the need for greater value chain alignment within the local milk producing subsector as an essential strategy for developing sustained competitive advantage.

## Medium Term Prospects of the Jamaican Dairy Sector

The crude consumption of milk and dairy products over the past decade is shown in Figure 2. Consumption over the past three years has averaged 117 million litres fluid equivalents; a 25 percent decline below the average of the previous seven years. The extent of the level of nutritional marginalization occasioned by the recent instability in the global market is better appreciated from the equivalent daily per capita consumption represented by gross national consumption. Compared to a World Health Organization recommended minimum daily allowance of 200 millilitres, per capita consumption fell to 115 ml per day during the past three years from an already sub-optimal 155 during the preceding seven.

A medium term demand-supply forecast to 2020 is given in Table 4. Projected local production is based upon potential natural expansion from the current population of breeding females of approximately 8000 females.

**Figure 2: Sources Of Milk Solids 1999- 2008**




| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|
| POWDER | 81.4 | 74.8 | 92.1 | 83.4 | 84.8 | 85.1 | 74.7 | 47.9 | 87.7 | 51.2 |
| CHEESE | 44.0 | 52.6 | 61.1 | 50.4 | 43.9 | 52.1 | 62.3 | 31.8 | 43.7 | 41.8 |
| ICECREAM | 0.59 | 0.73 | 1.24 | 1.87 | 2.19 | 2.6 | 1.8 | 1.7 | 2.3 | 1.2 |
| FRESH | 28.0 | 25.4 | 22.1 | 20.4 | 18.4 | 15.5 | 14.6 | 14.5 | 14.1 | 13.9 |
| TOTAL | 154. | 153. | 176. | 156. | 149. | 155. | 153. | 95.9 | 147. | 107 |

**Table 4**. Forecast of the demand and supply of milk and dairy products to 2020

| | **2009** | **2010** | **2011** | **2014** | **2020** |
|---|---|---|---|---|---|
| Population (million) | 2.76 | 2.78 | 2.80 | 2.86 | 2.90 |
| **Consumption** | | | | | |
| Daily per capita(ml) | 150 | 159 | 170 | 180 | 192 |
| Aggregate (L. M) | 152 | 161 | 174 | 189 | 200 |
| **Production** | | | | | |
| Fresh Milk Prodn (L. M) | 14.5 | 16.8 | 19.5 | 30.4 | 56.8 |
| Self-sufficiency (%) | 9.5 | 10.4 | 11.2 | 16.1 | 28.4 |

Adapted from JDDB/BDPAJ 2009

In the absence of substantial product diversification or export to regional neighbours, the local demand for fresh milk will remain the major determinant of growth in domestic milk production. In this regard the peak consumption of fresh milk of 38.8 million litres in 1992 and the fluid equivalent level of imports since

2006 (Fig. 2) provide a convenient benchmark for estimating medium term demand. On this basis it is postulated that the short term local demand for fresh milk is unlikely to exceed 30 million litres in the absence of a proactive policy to stimulate domestic consumption.

It has long been postulated that the National School Feeding Programme provides the natural platform for stimulating medium term demand for locally produced milk, through the implementation of a School Milk Programme targeted at providing each child within the public education system, with the WHO recommended allowance of 200 millilitres per day (Jennings 2002). Current enrolment of approximately 550,000 the public school system, represents a potential market for approximately 21 million litres per annum; sufficient to absorb along with the traditional markets, much of the 56 million litres projected for 2020.

Expenditure on the National School Feeding Programme in fiscal 2008 was approximately $1.65 billion. This provides for a phased expansion in the utilization of locally produced milk (and beef) over the next decade without any significant increase beyond current real expenditure levels. Increased product diversification will be critical to the sustainability of any National School Feeding programme by providing a buffer against reduced demand for liquid milk during the 13 weeks of school holidays.

The regional market for milk products, offers additional scope for expansion of the local dairy industry. Table 5, adapted from a recent CARICOM concept note (Caricom 2009), summarizes the demand/supply situation for selected members of the CSME and provides an estimate of aggregate demand and supply for milk and dairy products.

**Table 5**. Dairy Statistics for Selected CSME Members

| **Country** | **Population (`000)** | **Per capita Imports 2001-2003 (kg/yr)** | **Total Imports (MT)** | **% Self Sufficiency** |
|---|---|---|---|---|
| Antigua& Barbuda | 85.63 | 70 | 5994 | 51.1 |
| Bahamas | 342.0 | 99 | 33,858 | 4.9 |
| Barbados | 279.0 | 106 | 29,574 | 21.6 |
| Belize | 320.0 | 78 | 24,960 | 13.7 |
| Dom. Rep. | 9523 | 9 | 85,709 | 88.5 |
| Guyana | 772.3 | 69 | 53,289 | 38.6 |
| Haiti | 9035 | 8 | 72,284 | 53.2 |
| St. Lucia | 160.7 | 144 | 23,150 | 5.5 |
| Suriname | 472.0 | 24 | 11,328 | 64.4 |
| Trinidad & Tobago | 1305 | 103 | 134,415 | 4.5 |
| **CSME Total (Excl. Jamaica)** | **22,641** | **84.4** | **514,366** | **30.5** |

Excluding the Dominican Republic, which is nearly self sufficient, and assuming that regional self sufficiency levels increases to an average of 40 percent, it is projected that through an accelerated dairy investment programme, Jamaica could in the medium term safely expand production to beyond 100 million litres. The Jagdeo Initiative provides the framework for targeting investment through the established regional capital markets.

## Financial Viability of Investment in Dairy Farming

In a presentation to the recent UWI conference on 'Food Security and Agricultural Development', Jennings *et al* (2009) established the financial viability of capital investment in large scale, intensively managed dairy farms milking in excess of 1000 cows. Using a cluster farm model developed by the Beef and Dairy Producers Association of Jamaica (BDPAJ), the authors showed that the viability of a model which incorporated small farmer investment in professionally managed nuclear farms, would be significantly enhanced by the adoption of non-traditional financing approaches (within the Jamaican context) such as capital (equipment) leasing and cow-leasing. The case was also made that public investment, by way of equity participation, also provided a strategy for increasing profitability by reducing the debt burden on projects of this type.

Table 6 summarizes the comparative financial performance of four options for capitalizing such large scale cluster dairy farms.

**Table 6**. Financial Coefficients of Capitalization Options ($M except otherwise stated)

| | **Base Option** | **Cow-leasing** | **Equipment Leasing** | **Pref. Shares** |
|---|---|---|---|---|
| Cap. Invest | 329.07 | 253.19 | 248.92 | 329.07 |
| Peak Op. Ex | 119.3 | 96.3 | 121.1 | 122.7 |
| Unit Cost ($/L) | 26.69 | 21.56 | 27.11 | 27.47 |
| Net Income | 112.5 | 130.7 | 109.3 | 114.9 |
| Returns/ha | 0.585 | 0.681 | 0.569 | 0.598 |
| NPV…$_{8\%,\ 14yrs}$ | 476.9 | 663.3 | 485.9 | 472.3 |
| IRR (%) | 25 | 38 | 29 | 25 |

The ready availability of lease financing, particularly for capital intensive projects, has contributed significantly to the sustained international competitiveness of cattle farming in the major producing countries. Cow leasing has become increasingly popular in countries such as Argentina, New Zealand and the United States.

## SUMMARY

**The Role of the Jamaica Dairy Development Board in Overcoming the Challenges to Expanded Domestic Production:**

From the foregoing situational analysis the matrix below summarizes the most significant hurdles to any revitalization of the local dairy sector and possible intervention measures which might be given consideration by the Jamaica Dairy Development:

| Strategic Objective | Challenge /Constraint | Required Intervention |
|---|---|---|
| Expanded Production | Vulnerability to policy shifts | Promulgate medium/long term policy on increased self reliance/food sovereignty |
| | EU reinstatement of export rebates | Tariff reform – TRQ to promote greater use of local milk |
| | Vulnerability to disinvestment by large corporate entities | Support for small farmer clusters to broaden ownership base |
| | | Attract investment in large-scale dairying on state lands |
| | Domestic Market size | Policy on rationalization of school feeding programme |
| | | Collaborate with Agri-Invest Corp to promote coordinated regional investment in local dairy sector |
| Increased competitiveness | Excessive margins beyond farm gate | Promote value chain alignment through improved access to financing |
| | | Establish legislative framework for farmer/processor contracts |
| | | Empower consumer through information |
| | Low labour productivity | Develop modular ongoing competency certification programme |
| | | Promote entry of tertiary trained youth in dairying |
| | Vulnerability to spiraling input costs | Support R&D in endogenous feeding systems |
| | | Promote the management of 'grass as a crop' |
| | Heavy dependence on fluid milk | Promote R&D and investment in product diversification |
| | | Develop payment systems based upon quality and composition |
| | Comparatively high finance costs | Expand on DSRP concessional loan programme. |
| | | Promote non-traditional financing mechanisms |
| | | Exploit funding opportunities under the EPA. |

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