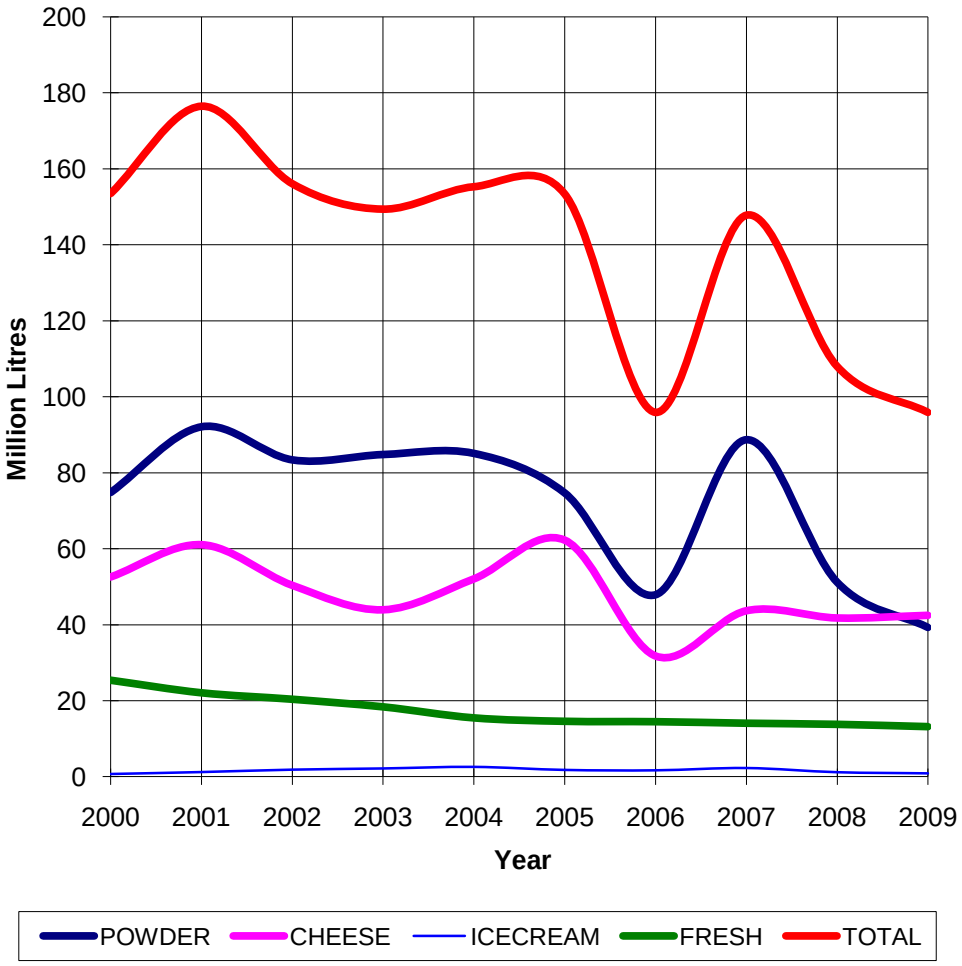
Jamaica Dairy Development Board

DAIRY

Facts & Figures

2009-10



Foreword

PREFACE

The demographics of the Jamaican population indicate that children below age 14 and women of child-bearing age constitute approximately 54 percent. This reinforces the primacy of milk as a critical component of national food and nutrition policy.

The 11th volume of *Dairy Facts and Figures* underscores the increased nutritional vulnerability large swaths of the Jamaican population as well as the lack of international competitiveness which stymies the sustainable contribution of the local milk producing sector to improved national food security. The current global recession following on the heels of the market volatility of 2007-2008, makes the revitalization of the Jamaican Dairy sector a national imperative. The 2009-2010 volume of *Dairy Facts and Figures* seeks to present a number of possible solutions in this regard.

The Board acknowledges the continuing assistance of STATIN, the Data Bank of the Ministry of Agriculture, Trade Board Ltd., The Beef and Dairy Producers Association of Jamaica, The Jamaica Dairy Farmers' Federation, The Eastern Livestock Development Association, The Jamaica Livestock Association Ltd. and other organizations and agencies which have continued to contribute to the compilation of this publication.

Paul Jennings, PhD
Chief Executive Officer
December 06, 2010

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1.0 Jamaica Dairy Development Board

The appointment of a Board of Directors with effect from September 09, 2009 coincided with the 10th anniversary of the Jamaica Dairy Development Board and effectively marked the beginning of its operation as a legitimate statutory authority. In his charge to the Board, the Hon. Minister of Agriculture outlined his **vision** for the sector as:

An internationally competitive domestic milk producing sector which contributes significantly to wealth creation in Jamaica by reducing national dependence on food imports while providing opportunities for a sustainable livelihood for the broad mass of small farmers who constitute the rural sector.

Consistent with this vision statement, the new Board immediately set about the task of crafting a Medium Term Strategic Plan around a **Mission Statement** defined as:

Ensuring the achievement of the measurable targets established by the Minister of Agriculture through policy formulation, capacity building and the creation of a regulatory framework to drive the attainment of international competitiveness.

The Medium Term Strategic Plan 2010-2014 has the defined strategic objectives of:

1. Expanded production; and
2. Increased international competitiveness;

In pursuit of the goal of doubling national milk production within five years to 30 million litres with a further doubling by 2020 to 56 million litres.

The Dairy Sector Revitalization Programme which commenced in fiscal 2008 provides the platform for direct intervention by the Board in rebuilding of capacity within the local milk producing sector. In order to ensure the sustainability of this initiative the Board has sought Cabinet approval for the implementation of a Dairy Industry Cess to be levied non-discriminately on both imports and locally produced milk. Following on consultation with stakeholders a Cess regime was adopted based upon using the average farm gate price of fresh milk during the preceding calendar year as reference price and assessing a rate of one (1) percent of this reference price per litre fluid equivalent of either imported solids or locally produced milk. On this basis the Board projects to raise J$64 million, commencing in fiscal 2010, toward the funding of the several capacity building initiatives identified in its Strategic Plan.

For the fiscal year 2009-2010 the Board's activities continued to be fully funded from the GOJ Capital A programme. Table 1 below summarizes the major activities undertaken.

Table 1. Summary of Major Activities – Fiscal 2009

Oprational Objective	Tasks Undertaken	Comments
Policy Formulation	Draft Cab Sub – Rationalization of School Feeding Programme	Pending request for comments from MOE, MOFP
	Draft medium term policy framework for cattle sector	Posted at www.jddb.gov.jm Awaiting industry ratification
	Made input into discussions on EPA and CARIBCAN negotiations	
	Cost of Production Survey 2008 completed and results published at www.jddb.gov.jm	Survey of cost of production 2009 initiated January 2010. Results being analysed
Capacity Building	Published 10th Vol. of Dairy Facts and Figures – Dec 2008	11th Volume delayed by non-completion of JSLC 2008
	Dairy Sector Loan – 10 beneficiaries YTD; Total since inception – 42. Total disbursement 08-09 - $64m	Supported: 80 ha pasture; YTD - 184ha Breeding Stock Purchased: 128; YTD-327 since inception
	Drafted Cab Sub for restructuring of JDFF loan	To facilitate vertical integration with cluster farms
	Drafted Cab Sub for lease of Wallens Dairy	To facilitate establishment of 500-cow cluster
	Canvassed FAO for TCP on Value Chain Alignment of Beef Sector	Report of consultancy under review
	Initiated UWI post-grad pasture study to develop nutritive profiles for enhanced pasture utilization	14 Participating beef and dairy farms island-wide
	Cost of production survey (2008) conducted	Results presented at farmers workshop, Oct 09
	Initiated National Dairy Herd Recording programme	Four herds representing >1300 cows on DRMS system
	Farmer training: Grant to RADA - $1m. JDDB provided HR for training of trainers	13 Livestock Extension Officers trained
	Technical support to ELDA: grant request to IDB	Grant of app. $13 M obtained for small farmer re-entry
	Grant support to BDPAJ - $3m	Pre-project management consultancy for clusters
	Paper on Financing dairy development presented at UWI, Mona Conf. July 2009	Cow-leasing and capital leasing proposed as options
	Establishment of Milk testing lab- Bodles	Eqpt. for components testing received. Somatic cell counter awaited
	Upgrading of forage Lab - Bodles	Supply contract awarded, supplies awaited
	50 Jersey embryos imported to initiate cow lease programme	Standard contract for surrogate mothers and subsequent rearing by beef farmers in preparation
	Feasibility of Biogas for electricity generation on dairy farms	Study currently being undertaken.
Other	Proposal submitted for revamping of WINDALCO operations	Instability has had negative effect on national output
	Financial & technical support to World Red Poll Congress & Minard Show	

1.1 The State of Jamaica's Food Security

Based upon data available from the 2009 *Survey of Living Conditions* conducted by the Statistical Institute of Jamaica, nominal per capita expenditure on milk and dairy products declined 4.2 percent to $5243. With respect to poorest 40 percent of the Jamaican population the JSLC 2009 data indicated a 5 percent reduction in nominal spending on dairy products to an average $2360 per person, the purchasing power equivalent of 13.7 litres of fresh milk at 2009 closing prices. This converts to 37.5 ml daily compared to the WHO recommended minimum of 200 ml per day. Based on the combined levels of local production and imports (Figure 1), Jamaicans consumed, on average, 97.3 millilitres per day, on a **fluid equivalent** basis, a decline of 11.5 percent below the 2007 level of consumption.

The data in Figure 1, taken in combination with the imputed decline in per capita consumption, clearly highlight the inherent vulnerability of import dependence as the underlying national strategy for nutritional assurance.

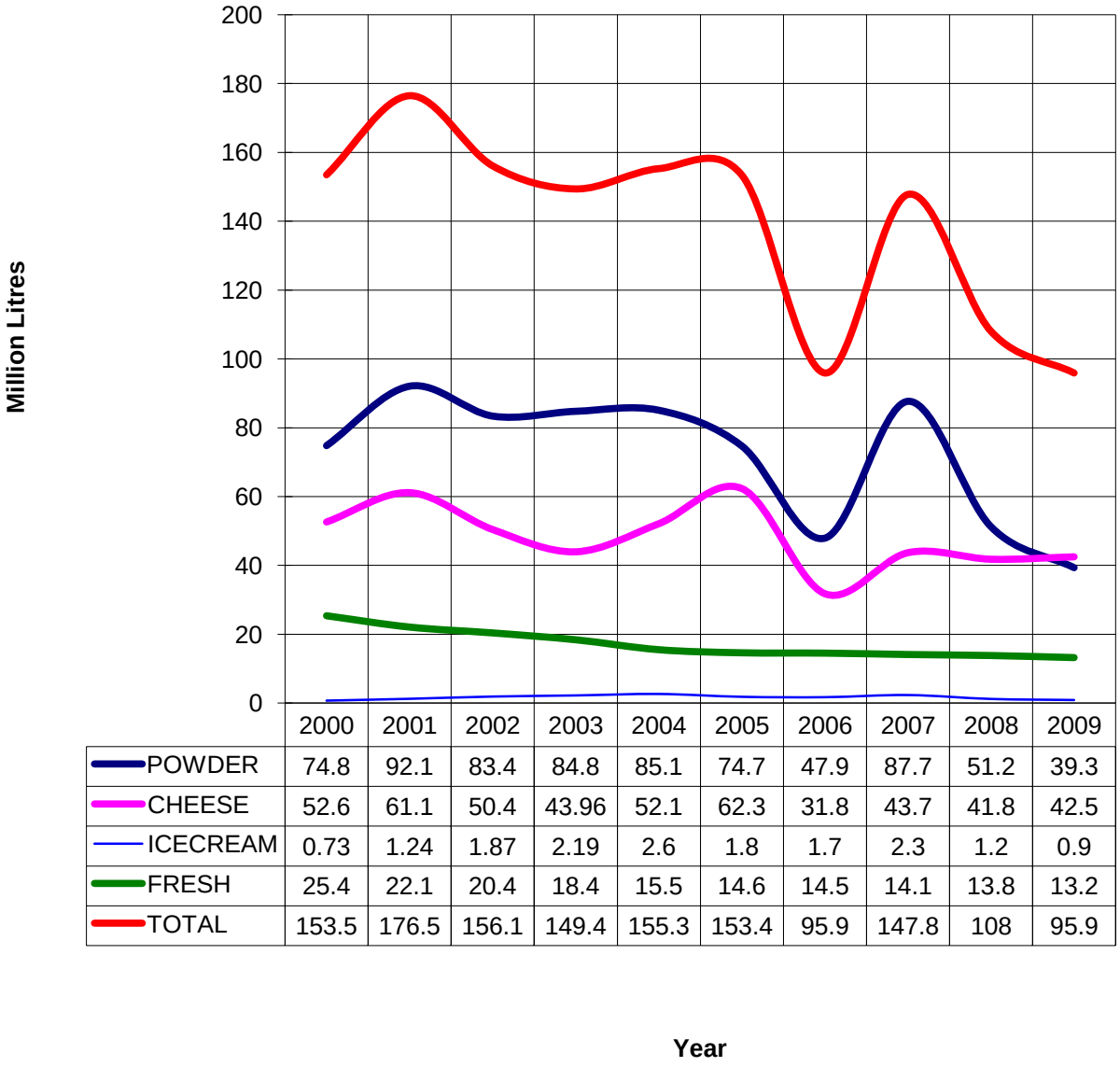
Milk powder imports declined a further 23 percent in 2009, year-on-year, following a 42 percent decline in 2008; the decline in 2009 reflecting, in part, the spiralling in world prices during the latter half of the year from a low of US$2300 to year-end prices of the order of US$4000 per ton.

Coming immediately on the heels of the 2007-08 food price spirals, the global recession has severely affected foreign exchange earnings, severely eroding Jamaica's capacity to maintain food import levels. This speaks clearly to the need for a refocusing of policy beyond *National Food Security* with its narrow focus on access and affordability, toward ***National Food Sovereignty*** which broadens the consideration to issues of availability, domestic wealth creation and livelihood protection.

Such a policy would give focus, inter alia to current constraints such as:

- Generation and dissemination of technology to drive greater efficiency and competitiveness;
- Catalyzing value chain alignment to enhance the survivability of the primary producer while empowering the consumer;
- Greater recognition of the role of state procurement in driving international competitiveness; the National School Feeding Programme offering a WTO-compliant vehicle for state support;
- Adopting a life-long learning approach to improving competency levels and ultimately labour productivity;
- A policy of affirmative action to attract greater participation of youth and women.

Figure 1: Sources Of Milk Solids



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
POWDER	74.8	92.1	83.4	84.8	85.1	74.7	47.9	87.7	51.2	39.3
CHEESE	52.6	61.1	50.4	43.96	52.1	62.3	31.8	43.7	41.8	42.5
ICECREAM	0.73	1.24	1.87	2.19	2.6	1.8	1.7	2.3	1.2	0.9
FRESH	25.4	22.1	20.4	18.4	15.5	14.6	14.5	14.1	13.8	13.2
TOTAL	153.5	176.5	156.1	149.4	155.3	153.4	95.9	147.8	108	95.9

The increased nutritional vulnerability indicated by the reduced nominal *per capita* expenditure on dairy products, is further confirmed by a 1.7 percent decline in overall nominal expenditure on food in 2009 to $94,382 per person per year. With 27.4 percent of the Jamaican population represented by the 0-14yr age cohort and a similar percentage being women of child-bearing age, milk remains a critical food in the national diet. Any measures for enhancing nutritional status within a policy framework of ***Food Sovereignty*** ought therefore, to give very high priority to a revitalized dairy sector.

1.2 The State Of Competitiveness of Jamaican Milk

The main cost factors determining the level of international competitiveness of the local milk producing sector have been derived from the annual Cost of Production Survey conducted by the Jamaica Dairy Development Board since 2000. The relative changes in variable costs between 2005 and 2009 and the relative proportion of costs attributable to various inputs are summarized in Table 2 below.

Table 2. Cost of production and distribution of costs in the production of milk 2005-2009

	2005	**2006**	**2007**	**2008**	**2009**
Average variable cost (AVC)	22.32	23.70	30.56	38.59	46.93
Average farm-gate price	24.00	26.00	28.33	41.84	46.33
Major cost components as % AVC :					
Purchased Feed	39.0	29.9	33.1	35.9	43.7
Labour	13.0	24.3	16.9	22.5	19.5
Utilities	7.0	6.5	10.1	9.6	6.4
Pasture maintenance	4.0	5.4	2.3	1.7	4.1
Vet & Med	3.0	3.4	4.3	2.4	3.3

Source: Ffrench *et al* 2010

The variable cost of producing milk locally during 2009 increased 21.6% above that of the previous calendar year. The 10.7 percent increase in the average price offered by processors meant that at farm-gate many farmers were stretched to secure positive gross margins.

Table 3 summarises the changes in the unit costs of the primary inputs.

Weighted on the basis of their respective contribution to variable cost the average imputed impact of the increases in the costs of the major inputs was of the order of 5.4%. This indicates the need for significant efficiency increments at farm-gate as a contribution to maintaining the affordability of fresh milk to the Jamaican consumer.

Table 3: Changes in farm gate and retail prices and unit costs of major inputs – 2009

Item	Unit Cost		
	1st Quarter	4th Quarter	% Change
Ave. Milk Price (S/L)	45.71	47.78	4.53
Ave Retail Price - Fresh ($/L)	167.2	171.60	2.63
Ave Retail Price – WMP 80gm	66.16	71.99	8.8
Conc. Feed ($/kg)	29.40	31.0	5.4
Fertilizer N ($/kg)	90.34	108.02	19.57
Electricity ($/kWh)	20.29	29.60	45.9
Potable water ($/L)	0.190	0.193	0
Labour ($/md)	1696	1696	0

Retail margins remain a major obstacle to improving the international competitiveness of the local dairy sector as indicated by final quarter retail margin of 259%, which compares with a corresponding average margin of 188% in the US.

It is anticipated that with the move toward lowering interest rates as a macro-economic objective, that this will provide the driver for increased competitiveness.

The Board restates its position that a rationalized National School Feeding Programme remains a key driver not only for increased local production, but critically, also for promoting product diversification and improved international competitiveness. The Jamaica Dairy Development Board has proposed that a policy be adopted whereby only *semi-skimmed* liquid milk is allowed as school milk; primarily to obviate concerns regarding childhood obesity, but also to stimulate a widening of the product range, to cushion the reduced margins on liquid milk obligatory to accessing the School Milk programme.

2.0 Status of the Dairy Sector

2.1 Overview

The fiscal year was marked by a significant downturn in output by WINDALCO which had a depressing effect on overall national output. The decision taken by UC-RUSAL in March 2009, to indefinitely suspend their Jamaican bauxite mining/alumina operations resulted in a 35 percent reduction in milk production in the subsequent quarter (year-on-year); the residual effects of which are likely to continue to be felt well into the 2010/11 fiscal year. In spite of subsequent efforts to restore normal dairy management procedures, the net effect was a 13 percent

decline in fiscal 2009 compared to the previous year. On a calendar year basis production in 2009 (2.533 million litres) represented a 21 percent decline in milk output by the multinational.

The prolonged drought of 2009 further exacerbated the national situation limiting the anticipated growth in output at Serge Island to only 5.7 percent; inadequate to offset the effects of the downturn at WINDALCO, which in calendar 2008 had accounted for 23.2 percent of national output compared to 42 percent by Serge Island. Of the remaining smaller farms 38 dairy units benefited from the capacity-building initiatives under the Dairy Sector Improvement Programme. The impact of this intervention was highlighted by the fact that the potential adverse effect of the severe drought was mitigated to the extent of a mere 1.1 percent decline in milk output among otherwise very vulnerable farmers.

At the international level, the average FOB (high) prices of the major milk solids fell by 27.5 percent in calendar 2009 compared to the previous year. The significant upward movement in prices during the final quarter of 2009, however, possibly forebodes another price spiral, closing prices of all except cheddar, surpassing those of January 2008.

The local sector faces the seemingly insurmountable challenge of a combination of significant increases in efficiency and price restraint at all levels, as regular complaints of high returns of pasteurized milk suggests that current retail prices are approaching the limits of the price-elasticity of fresh milk. March 2010 retail prices of the order of $175.00 per litre compare with fluid equivalent prices of $112.00 per 80gm sachet of whole milk powder, a differential well outside the range of any consumer indifference.

2.2 Imports of Milk Solids

Imports of milk solids in **calendar 2009** fell 14.2 percent compared to the previous year, to 12,638 metric tons. This compares with an average import level of 16,990 metric tons for the preceding four years (Fig. 2). The reduced volume of imports appears somewhat anomalous given the general decline in average international prices in 2009 compared to 2008 but might be a reflection of a level of consumer resistance, given that local retail prices have not paralleled the general world market price declines following the 2006-07 hikes .

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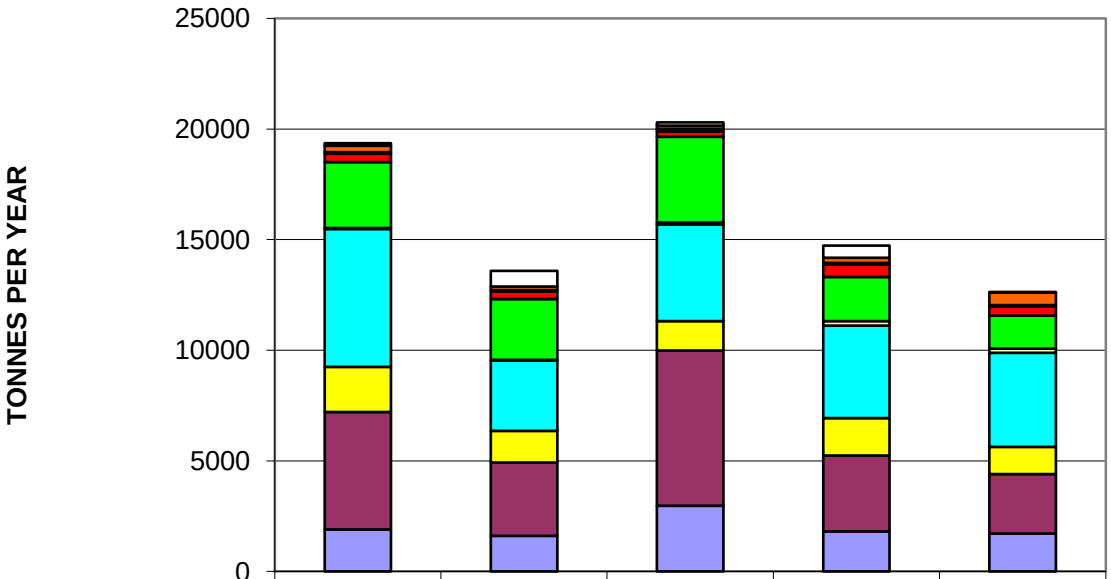
Figure 2: Dairy Product Imports 2005-2009



	2005	2006	2007	2008	2009
Others	114.6	710.9	140.7	541.9	15.9
Yoghurt	281.4	149.3	149.3	238.7	580.2
Cond./Evap. Milk	77.3	67.2	120	67.9	64.2
Whey Powder	372	345	246	564.2	414.8
Ice Cream	2986	2739	3872	2002	1494
Milk & Cream	44.3	40.3	87.7	207.5	189.5
Cheese	6229	3177	4368	4175	4252
Whole Milk Powder	2043	1428	1330	1692	1232
Skim Milk Powder	5304	3319	7008	3424	2681
Butter Fat	1900	1607	2974	1814	1713

Years

Source: STATIN

Expenditure on dairy product imports declined to US$43.04 million (Table 4); 28 percent below 2008 outflows and twice the corresponding fall in quantum of imports. This is indicative of the significant reduction in annualized average international product prices between years.

Table 4. Annual Imports of Milk Solids by Value (US$'000) 2005-2009

Product	2005	2006	2007	2008	2009
Milk & Cream	104.39	81.64	313.6	666.9	606.4
Skim Milk Powder	12,561.85	7,724.38	15,082.21	12,334.36	6,581.5
Whole Milk Powder	4,926.71	3,947.31	5,181.60	7,626.71	3,371.6
Cond./Evap. Milk	127.27	142.38	295.69	210.30	204.2
Whey Powder	673.11	647.30	574.26	1,391.03	633.5
Ice Cream	5,559.96	6,062.73	5,988.75	7,845.08	3,958.0
Yoghurt& sour milk	497.16	549.7	681.79	820.62	1,746.2
Cheeses	22,196.43	15,094.12	22,337.24	21,173.22	20,162.0
Butter Fat	5,531.95	3,689.56	5,951.03	8,969.29	5,691.0
Others	464.78	1,734.26	3,096.22	1,637.12	89.9
Total	**52,643.6**	**39,673.4**	**59,502.39**	**60,105.61**	**43,044.5**

Source: STATIN Import Database

At a declared CIF value of US$6581.5 million, the imputed import cost (CIF) for skimmed milk powder, of approximately US$2455 per ton, compares with an average 2009 FOB price of European product of US$2325 per ton (Source: AMS – USDA, International Dairy Market News, Dec 2009). The corresponding figures in respect of whole milk powder were US$2737 and US$2600 (High FOB) per ton. The differentials of the order of 5.6 and 5.2 percent, respectively, between declared CIF and quoted FOB prices for SMP and WMP indicates greater convergence than in previous years.

2.3 Trends in the International Market for Milk Solids

Milk production by the 39 leading producer countries in calendar 2009 (Table 5), fell for the first time in five years, in aggregate by 0.6 percent, to 429.8 million tons (USDA – FAS, July 2010). A 6.6 percent growth in output in Oceania was inadequate to offset declining production among the other regions. China's consumption of fresh milk fell for the first time in a decade, declining by 19 percent compared to 2008 and reflecting a 17 percent fall in production.

Table 5. World Milk Production, Consumption and Exports 2005-2009

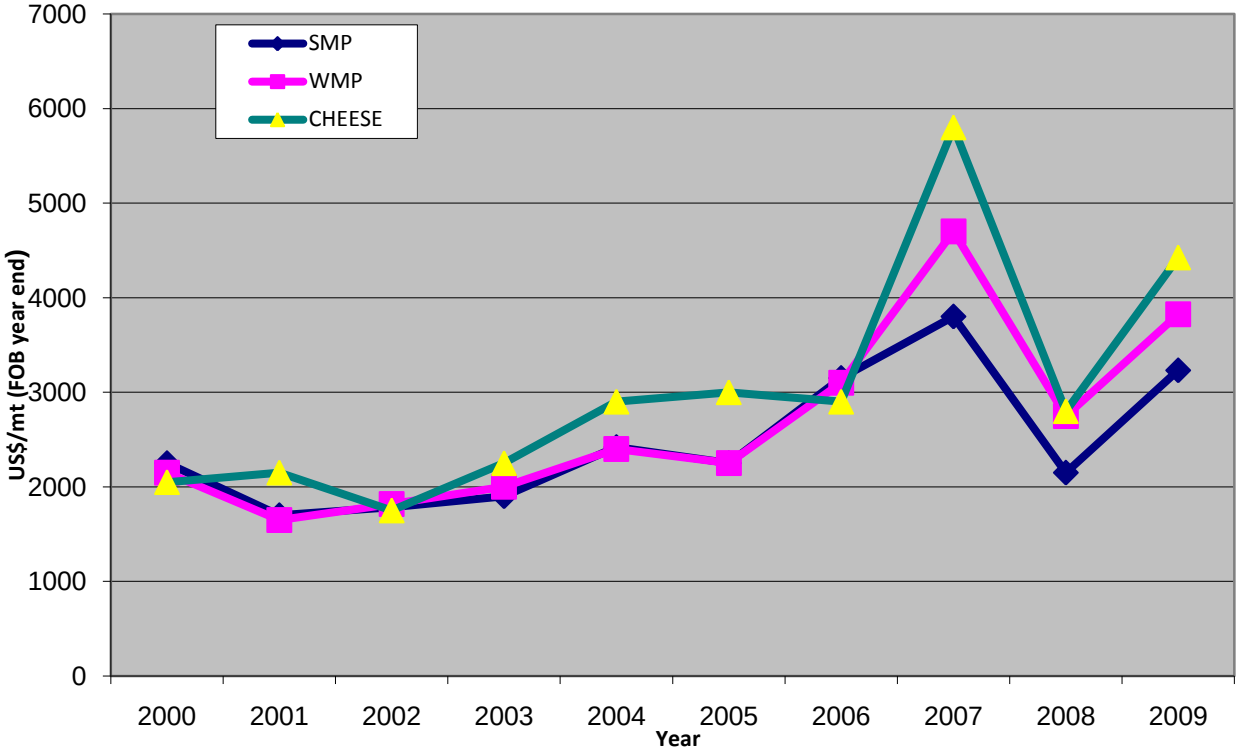
	2005	2006	2007	2008	2009
Fluid Milk Production/Consumption (million tons)					
Production	410.3	419.2	427.8	432.5	429.9
Consumption - World	159.4	163.9	160.6	163.6	161.2
Consumption - China	12.50	13.81	14.82	14.58	11.79
Exports (million tons)					
Cheese	1.238	1.235	1.293	1.261	1.186
Butter	0.788	0.765	0.826	0.720	0.673
Skimmed Milk Powder	1.000	1.003	1.130	1.082	1.076
Whole Milk powder	1.523	1.541	1.468	1.606	1.528
Total Exports (Fluid Equivalents)	**41.86**	**41.83**	**43.71**	**43.11**	**41.30**
Powder Imports - China	0.120	0.136	0.099	0.101	0.230

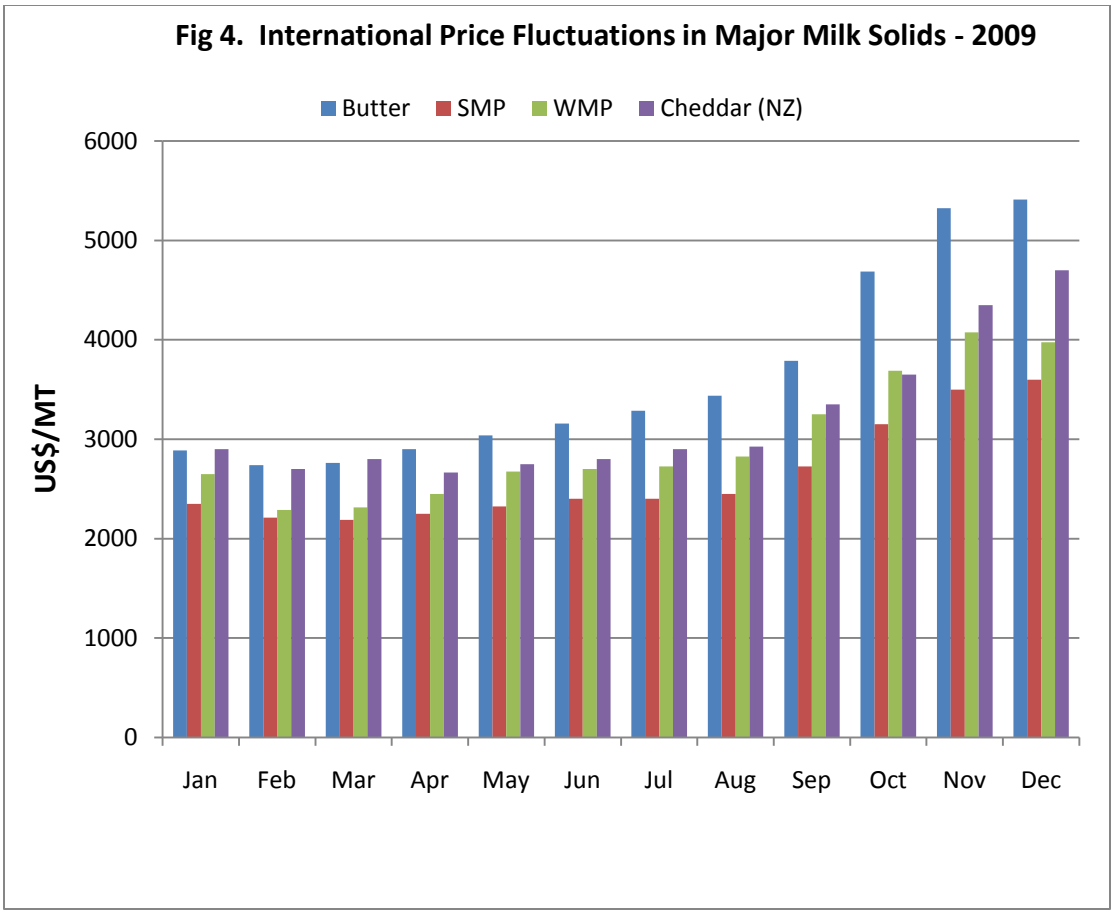
Source: USDA – FAS Dec, 2009

On a fluid equivalency basis, exports of the major traded milk solids declined 4 percent below 2008 levels. Associated with this reduced demand was a general reduction in average annual prices, those of skimmed and whole milk powder, respectively, declining by 26.7 and 32 percent. Cheese showed the greatest decline at 38 percent while the average price of butter fell by 13.6 percent.

Figure 3 shows the variation in closing FOB prices for powdered milks (ex EU) and cheese (Oceania) over the decade ending 2009 (www.ams.usda.gov). Average calendar year prices of cheddar, whole milk and skimmed milk powder for 2009, declined 32 percent compared to the previous year. However, December prices for these three products had moved on by an average 58 percent compared to January prices. Against the background of reduced world output, the price hikes commencing in September 2009 forebodes another round of price spirals (Figure 4).

Fig. 3 Trends in International Prices of Milk Solids - 2000-2009





2.4 Consumer Expenditure on Milk Solids

Mean nominal *per capita* expenditure on milk solids in calendar 2009 declined 4.2 per cent below the previous year; for a national average of $5243 (Table 6). This corresponded to 5.5 percent of estimated national *per capita* expenditure on food and beverage, marginally below the 5.7 percent recorded in 2008. In aggregate per capita expenditure on food and beverages also declined (1.7%) below 2008, possibly a reflection of the impact of the global recession which has seen, *inter alia*, significant reduction in personal remittances, a major influence on consumption among the poorest 40 percent of the population.

An inflation rate of 10.2-percent was recorded for calendar 2009; indicating that real expenditure on dairy products would have declined by 14.4 percentage points below the previous year.

Average retail price of fresh milk moved 15 percent in calendar 2009 compared to the previous year. As an index of the price trends for dairy products generally, this provides a major reason for the continued slippage in the share of food expenditure commanded by dairy products.

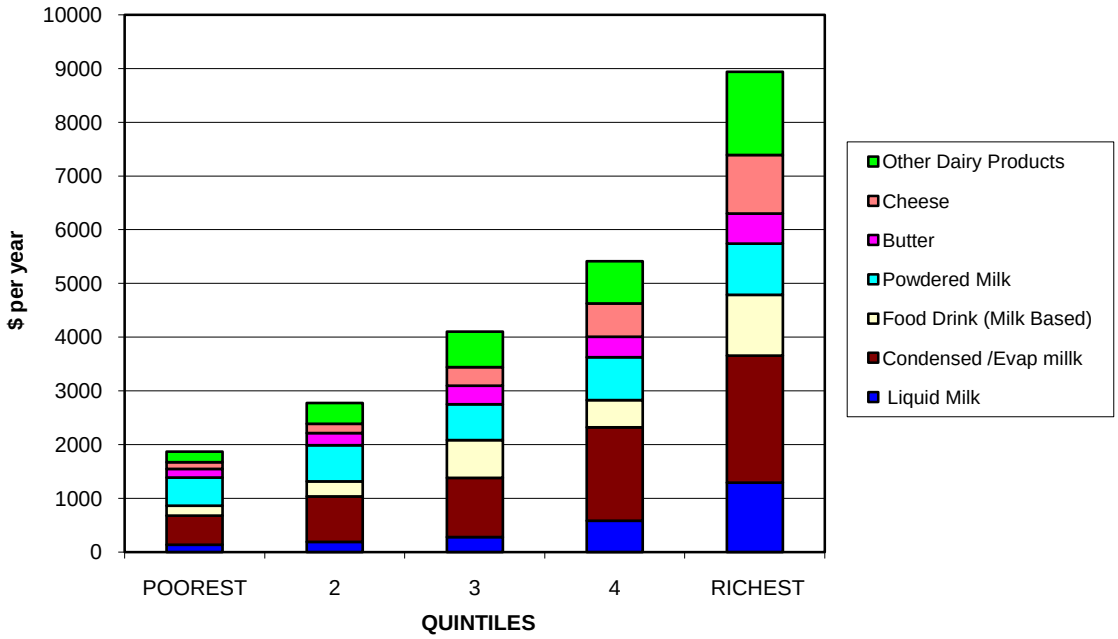
Table 6: Mean *Per Capita* Expenditure on Selected Dairy Products –2009 (J$)

Product	**Jamaica** (n=9047)	**KMA** (n=2890)	**Other Towns** (n=2097)	**Rural Areas** (n=4060)
1. Liquid Milk inc. flavoured	554.3	654.2	566.2	477.1
2. Condensed/Evap. Milk	1378.4	1496.3	1398.2	1284.2
3. Food Drink	583.0	694.7	447.4	573.6
4. Powdered Milk	732.4	533.9	859.3	808.2
5. Butter	336.1	279.6	405.3	340.5
6. Cheese	509.6	654.2	506.9	408.0
7. Other Dairy Products (yoghurt, ice cream)	809.9	1269.9	645.3	567.5
Total	**4903.7**	**5582.7**	**4828.6**	**4459.1**
Adjusted for Dairy Meals 'Away from Home'	**5243.0**	**6188.3**	**5109.8**	**4639.4**

n= number of household members
Source: STATIN SLC (2009) database

While *per capita* expenditure on dairy products among the poorest quintile remained essentially constant between years ($1870 vs. $1854), there was a 1.7 percent reduction by the wealthiest quintile to $8930 in 2009 compared to $9100 in 2008. This provides empirical evidence that dairy product prices are approaching the limits of their price and income elasticities. The disparity in apparent consumption between the poorest and the wealthiest quintiles - a factor of 4.8 - was similar to the 4.9 recorded in 2008.

Figure 5: Mean Annual Per Capita Expenditure on Dairy Products Within Wealth Groups - 2009



Daily *per capita* consumption of dairy products in 2009 declined a further 10 percent to 97.3 ml following on a 26 percent year-on-year decline for the previous year. On the basis of an average retail price of fresh milk of approximately $166 per litre, *per capita* expenditure by the poorest 40 percent of the Jamaican population, translated to 37.5 millilitres fresh milk equivalent and by the wealthiest, 147.4 ml; both significantly below the WHO RDA of 200 ml.

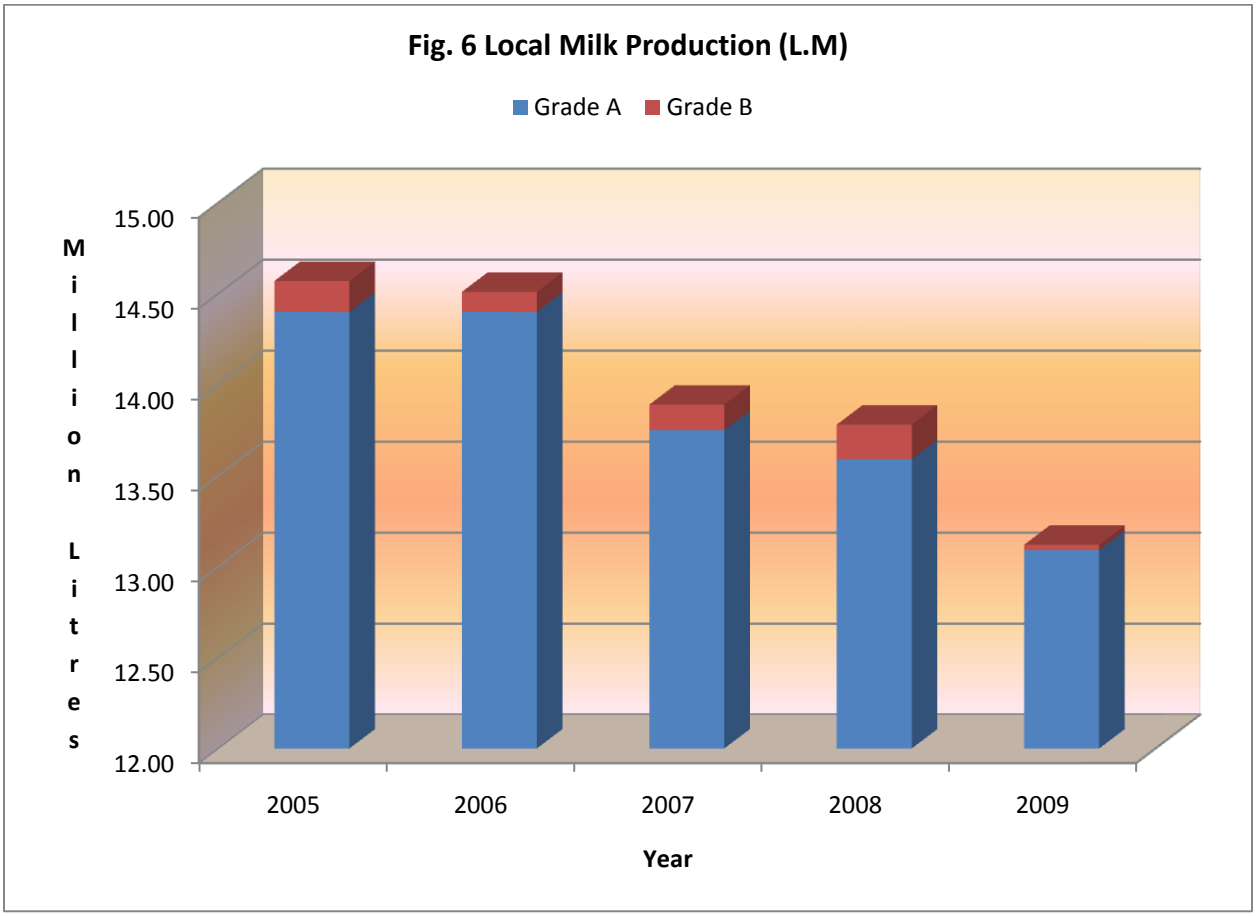
2.5 Value of the Industry

Based on the adjusted *per capita* expenditure of $5243 (Table 6), and an official population estimate of 2.699 million (STATIN), turnover by the dairy industry in 2008 is estimated at approximately $14.15 billion, in aggregate a three percent decline below the imputed contribution to GDP in 2008. At an average farm-gate price of $46.33, gross farm-gate returns in 2009 were indicated as $611.6 million a mere 4.3 percent of total industry turnover.

2.6 Local Milk Production

For 2009 milk production declined 4.3 percent to 13.2 million litres, compared to the previous year (Figure 6); the combined impact of significant downturn in production by a major player, WINDALCO, and the prolonged drought which extended well beyond the summer of 2009.

Fig. 6 Local Milk Production (L.M)



Retail prices averaged $166.02 per litre in calendar 2009, a 15 percent increase compared to 2008. Retail margins widened to 261 percent (from 248% in 2008), while the average farmer had to withstand operating losses. This again emphasises the critical importance of aligning the value chain to any sustainable revitalization of the local dairy sector.

3.0 Cost of Production Survey 2009

Summary of Findings

Average cost of producing milk in Jamaica during calendar 2009 was estimated from a survey of 17 farms during the period January to March 2010. There were no small farm participants in the current survey.

Farms were compared on the basis of variable costs in order to remove the effect of differences in farm size and structure as they relate to fixed costs.

Output per hectare in 2009 was indicated at 4300 litre, indicating an 11-percent decline in productivity compared to 2008.

The mean variable cost of producing milk in 2009 was $46.93; 21.6 percent above that of the previous year. Average farm-gate price, however, increased by only 10.7 percent to $46.33 per litre; effectively an operating loss for the average farm participating in the survey.

Fertilizer and electricity costs increased by 19.6 and 45.9 percent, respectively, between the first and fourth quarters of fiscal 2008, while proprietary concentrate feeds, the major contributor to variable costs, increased by only 5.4 percent. The reduction in output per hectare in 2009 was arguably a major contributor to the increased unit cost of producing milk. Given the protracted droughts of 2009, the critical importance of access to quality conserved fodder is highlighted.

Relevant tables are attached for information.

Table 7: Comparison of Mean Stocking Rates and Production per Hectare among Farm Sizes

Category	Stocking Rate (cows/ha)	Production (L/ha)
Medium Non-Irrigated	1.91	1772
Medium Irrigated	2.60	2938
Large Non-Irrigated	1.84	3096
Large Irrigated	3.51	9392
Overall mean	**2.47**	**4300**

Table 8: Comparison of Local and International Costs of Producing Milk

Category	2004	2005	2006	2007	2008	2009
AVC Jamaica (J$)	19.13	22.09	23.70	30.56	38.59	46.93
" (US$)	0.31	0.35	0.36	0.44	0.53	0.53
Farm Gate Ja. (J$)	20.00	22.63	26.00	28.33	41.84	46.33
" (US$)	0.33	0.36	0.39	0.41	0.57	0.52
AVC USA (US$)	0.23	0.25	0.26	0.30	0.36	0.33
Farm Gate USA (US$)	0.35	0.34	0.29	0.43	0.41	0.29
Retail Price Ja. (J$)	71.37	76.00	81.00	118.17	144.38	166.02
(US$)	1.16	1.20	1.23	1.71	1.98	1.88
Mark-up (%)	256.85	235.84	215.40	287	245	262
Retail Price USA. (US$)	0.83	0.84	0.81	0.92	1.00	0.82
Mark-up (%)	137	147	179	114	144	183
Farm Gate NZ (US$)	-	0.22	0.21	0.31	0.37	0.26

Table 9: Comparison of Average Direct Costs over the Past 5 Years on Medium and Large Farms

Items	**2005**	**2006**	**2007**	**2008**	**2009**
AVC. (J$)	22.32	23.70	30.56	38.59	46.93
Av Farm Gate Price (J$)	24.00	26.00	28.33	41.84	46.33
AVC Ja. (US$)	0.35	0.39	0.41	0.53	0.53
Irrigated Farms	18.42	20.25	27.91	38.00	43.55
Non-irrigated Farms	25.90	27.66	31.45	42.62	47.38
Gross Margin (%)	-3.0	11.0	-8.0	8.0	-1.0

Table 10. Changes in Proportion of Variable Cost Due to the Various Input Categories

Category	**2005**	**2006**	**2007**	**2008**	**2009**
Feed	39.0	29.9	33.1	35.9	43.7
Utilities	7.0	6.5	10.1	9.6	6.4
Labour	13.0	24.3	16.9	22.5	19.5
Vet & Med	3.0	3.4	4.3	2.4	3.3
Pasture Maintenance & Fertilizer	4.0	5.4	2.3	1.7	4.1

ABSTRACTS/SUMMARIES/SYNOPSES

Revitalization of the Jamaican Dairy Sector:
Strategies for Financing New Investments in Dairying

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Abstract

The Jamaican dairy sector has undergone severe attrition, consequent to the adoption of a policy of trade liberalization in 1992, resulting in milk production declining 64 percent to current levels bordering on 14 million litres per annum.

The recent volatility in the international market for milk and dairy products, exposed the inherent weaknesses of over-reliance on imports to shape national food and nutrition policy. Consequently, the current political administration has positioned the revitalization of the dairy sector as a key plank of its policy for enhanced national food security.

The expansion of the local dairy sector, however, is constrained by high start-up capital cost requirements and marginal returns on traditional approaches to primary milk production which contribute to the difficulty in accessing capital financing from financial institutions. Therefore, novel approaches are required to finance dairy projects and to develop business models to lower barriers to entry, thus enabling the participation of small-scale farmers in the development process.

*The Beef and Dairy Producers' Association of Jamaica (BDPAJ) has advanced a model — **Large-Scale Cluster Dairy Farms** — professionally managed nuclear farms, to enable small farmers to invest cows in the cluster under terms of a long-term management contract. Participants would benefit from greater economies of scale than they would achieve, operating as stand-alone units, thus being able to rationalize the utilization of their limited holdings.*

Analysis of strategies for financing the implementation of the BDPAJ model indicates that consideration be given by local Development Financing Institutions to adopting lease financing as a means of enhancing financial viability.

Paper prepared for Conference on 'Food Security and Agricultural Development in the Americas', UWI, Mona Campus, Kingston, Jamaica, July 28-30, 2009.

UWI Pasture Study – Abridged Preliminary Report

Enhancing the Contribution of Pastures to Livestock Production in Jamaica: *The Influence of Season and Geography on the Nutritive Value of Improved Pasture Species.*

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Background:

Out of a need to contribute to improved feeding efficiency, the Jamaican Bureau of Standards (BSJ), in 2006, commissioned a review of its standards for proprietary dairy rations. It was self-evident that for these revised standards to be effective, they would need to be applied in conjunction with relevant information on the nutritive value of forages and in particular grazed pasture; the common system of feeding cattle in Jamaica. Recognizing that the site-specific response of pasture limited the applicability of much of the earlier work done, the Jamaica Dairy Development Board – Ministry of Agriculture and Fisheries in 2001, initiated a series of on-farm evaluation of pastures under conditions of commercial dairy farming, to establish nutritive profiles of popular improved grass varieties as well as the cost of producing pasture herbage.

The present study, to a large extent, is a continuation of the work initiated by the Jamaica Dairy Development Board and is aimed at including more farms (including beef farms) that are representative of a wider geographical spread and thus provide more in-depth analysis.

Progress to Date:

Twelve (12) rounds of sampling (monthly) were done between August 2009 and July, 2010 from the fifteen (15) participating farms (6 beef and 9 dairy). This involves cutting approximately 10 samples within a 0.25m^2 quadrat and randomly collected hand-pluck samples per pasture monthly. This yielded a total of 720 sub-samples, half of which were hand-plucked. Two soil sub-samples were taken from each farm (n=30) at 15cm depth at the beginning of the study.

Neutral detergent fiber (NDF) analysis has been done on eight of twelve sets of samples (n=480) spanning the period August 2009 to March, 2010. Determination of crude protein (CP) was done on four

of twelve sets of samples (n=240), representing the period August, 2009 to November, 2010. Two of twelve (n=120) sets and two of four (n=60) sets of samples were analyzed for *in-vitro* organic matter digestibility (IVOMD) and gross energy (GE) respectively. Biomass yield was calculated for the period August, 2009 to January, 2010.

Summary of Results Obtained:

Pastures from 15 cattle farms (9 dairy and 6 beef) were analyzed for soil fertility, biomass yield, chemical composition (CP, NDF, GE) and IVOMD between August, 2009 and July, 2010. A summary of the results are presented.

The ranges (ppm) for P_2O_5, K^+, Ca^{2+}, Mg^{2+} and SO^{2-}_4 were 6-483, 0.18-1.91, 7.5-149, 0.68-16.06 and 3.23-22.72, respectively and for N (%) and CEC (meq./100 gm soil) were 0.19-0.44 and 13.32-46.10, respectively. FM Jones beef farm and Bengal Est. and Bodles; jointly recorded the highest and lowest percent nitrogen, respectively. Relatively neutral pH (5.3–7.4) was recorded.

Average biomass yield (kg DM/ha.) on dairy farms were 8,403, 3,556, 6,486, 7,301 6,320, 4,967, 9,183, 7,892 and 3,625 for FM Jones Dairy, Rhymesbury Dairy, Bengal Estate and Ponderosa Dairy, Bogue Hill Dairy, Edward's Dairy, Serge Island Diaries, Unity Valley Dairy and Bodles Research Station, respectively. Average biomass yield (kg DM/ha.) on beef farms were 7,546, 6,794, 6,253, 3,336, 6,878 and 8,058 for Allied Farms, FM Jones Beef, Grove Place, Minard Estate, Llanrumney Estate and Barkeith Farms, respectively

The ranges of crude protein for hand-pluck samples were 9.7-14.9 and 6.4-12.6% for dairy and beef farms, respectively. Samples harvested at ground level were, on average 3.3 and 2.4% lower than the respective samples taken by hand plucking.

Mean range of NDF of hand-plucked samples were, respectively, 65-71 and 63-70.3% for dairy and beef farms, respectively. Hand-plucked samples were 4.5 and 4.1% lower than those cut at ground level from dairy and beef farms, respectively. The mean GE value of samples harvested at ground level and by hand-plucking was 18.8 and 18.2 MJ/kg DM, respectively. The corresponding ranges were 16.9-21 and 15.7-21.1 MJ/kg DM.

Mean *in-vitro* organic matter digestibility was 58.7 and 65.7%, respectively for samples harvested at ground level vs. hand-plucked samples. The corresponding ranges were: 47.7- 64.4% and 51.2 – 72.8, respectively. There was an average difference in digestibility, of only 3 percent between samples harvested in August and September, 2009.

Revitalization of the Jamaican Dairy Sector. III

Biogas as an Option for Enhancing International Competitiveness

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Summary

The heavy reliance of the local dairy sector on imported inputs has exposed its vulnerability to the spiralling costs of the key inputs into the production of milk and has contributed to increasing competitive disadvantage in local milk production relative to world leading producers. As at 2008 the average variable cost of production in Jamaica, put local milk at a comparative disadvantage of 47 and 103 percent respectively, compared to the US and New Zealand. As a consequence operating margins enjoyed by local producers have rendered local production of milk increasingly unsustainable.

This paper examines the impact of the four key inputs into milk production (Concentrate Feeds, Fertilizer, Labour and Electricity) on the state of competitiveness of milk production in Jamaica. It reviews earlier recommended strategies for the first three and analyses the potential contribution of on-farm generation of electricity from Biogas, as an option for improving operating and financial efficiencies.

A sampling of eight dairy farms of varying sizes provided base data on electricity consumption and costs during 2009. The data indicated a significant linear relationship between daily electricity consumption and herd size, the individual cow within the herd, requiring 0.66 kWh per day and a contribution to variable cost of $2.60 per litre from electricity usage.

For dairy herds of 250 cows and above, the switch to on-farm generation of electricity from Biogas, consistently improved the unit cost of production as well as net present value and internal rates of return. At herd sizes of approximately 60 cows the financial outlays and depreciation charges associated with the investment in bio-digester and prime diesel electricity generator, makes this option non-viable and further reduces the cost-competitiveness of operations of this scale. There might be virtue, therefore in adopting a cluster approach to electricity generation from biogas at the Dairy Cooperatives at Rhymesfield and St. Elizabeth where individual farms are typically below 60 cows.

The analysis provides economic and financial justification for the promotion of electricity generation from Biogas for which dairy farms are particularly endowed given the huge disparity between generation capacity and requirement on dairy farms. Additionally, from an environmental perspective, the established negative impact of livestock on climate-change, adds justification to a national strategy of biogas generated electricity on dairy farms.

Paper accepted for presentation at 46th Annual Conference, Caribbean Food Crops Society, Boca Chica, Dominican Republic, July 11-17, 2010

ANNEXES

Annex 1. Annual Imports of Milk Solids

Annual Imports of Dairy Products (kg)		
	2008	**2009**
Milk & Cream	207,563	189,542
Skim Milk Powder	3,423,820	2,681,460
Whole Milk Powder	1,692,462	1,232,549
Condensed/Evap. Milk	67,866	64,189
Whey Powder	564,269	414,848
Ice cream	2,001,747	1,494,216
Yoghurt/Sourmilk	238,740	580,214
Cheeses	4,174,705	4,252,025
Butter Fat	1,814,403	1,713,339
Others	541,871	15,929
Total (kg'000)	**14,727,446**	**12,638,311**

Source: STATIN

Annex 2. Per Capita Expenditure (J$) by Wealth Groups- 2009

			QUINTILES		
n=	1175	1172	1177	1177	1201
Product	**POOREST**	**2**	**3**	**4**	**RICHEST**
Liquid Milk	137	189	278	580	1292
Condensed/Evap Milk	543	846	1100	1743	2366
Powdered Milk	526	672	668	796	953
Food Drink (Milk Based)	182	282	706	506	1128
Butter	158	223	342	385	564
Cheese	124	175	349	618	1085
Other Dairy Products	200	387	660	785	1551
Dairy products ex home	27	50	46	277	879
Total (Dairy products)	**1890**	**3075**	**4421**	**6596**	**10100**
Other meals ex home	6557	13,715	20,878	28,256	53,408

Source: STATIN-SLC 2009

Annex 3. Grade "A" and "B" Milk Production 2003 -2009

Year	Milk Production (litres)		Total
	Grade A	Grade B	
2003	17,665,431	732,519	18,397,950
2004	14,987,982	462,000	15,449,982
2005	14,404,797	169,000	14,573,797
2006	14,402,524	105,587	14,508,111
2007	13,954,328	139,568	14,093,896
2008	13,586,866	190,373	13,777,239
2009	13,094,129	30,925	13,125,054