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# SRI LANKA CONNECTING REGIONAL ECONOMIES (USAID/CORE)

## Dairy Assessment in Eastern, Uva, and North Central Provinces of Sri Lanka

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# SRI LANKA CONNECTING REGIONAL ECONOMIES (USAID/CORE) PROGRAM

## Dairy Assessment in Eastern, Uva, and North Central Provinces of Sri Lanka

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The author’s views expressed in this publication do not necessarily reflect the views of the U.S. Agency for International Development or the United States Government.

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## Abbreviations and Acronyms

AFS	Australian Friesian Sahiwal
AI	Artificial Insemination
ALDL	Agro Livestock Development Loan
AMZ	Australian Milking Zebu
CP	Collection Points
CORE	Connecting Regional Economies
DAPH	Department of Animal Production and Health
PDAPH	Provincial Department of Animal Production and Health
FAO	Food and Agricultural Organization
FCMP	Full Cream Milk Powder
FMS	Farmer Managed Society
GDP	Gross Domestic Product
GOSL	Government of Sri Lanka
LDI	Livestock Development Instructor
LME	Liquid Milk Equivalents
LKR	(Sri Lankan) Rupees
MILCO	MILCO (Private) Ltd
MCC	Milk Collection Centre
MCP	Milk Collection Point
MILKFED	Sri Lanka Milk Producer Cooperative Federation Ltd
MLDC	Mid-Country Livestock Development Centre
MPU	Milk Producers Union
MT	Metric Ton
NLDB	National Livestock Development Board
NGO	Non-Governmental Organization
PCC	Per Capita Consumption
SNF	Solids-non-fat
UHT	Ultra-High Temperature
UMMB	Urea-Minerals-Molasses Block
USAID	United States Agency for International Development
VRI	Veterinary Research Institute
VS	Veterinary Surgeon

Exchange Rate (July 2009): USD 1 = LKR 113.5

## Executive Summary

Sri Lanka has a total land area of 65,610 sq. km; 30% of which is agricultural land, 75% of which is farmed under smallholdings. The livestock sector contributes just 1.2 percent to the GDP, but is an integral part of the rural economy providing draught power, manure, meat, milk and transport. The dairy sector is considered the most important sub-sector of the livestock industry, because of its potential influence on the rural economy.

National Livestock Statistics<sup>1</sup> show a steady growth in annual milk production (cows plus buffalo) during the 60s and 70s, but stagnant growth since then. Estimates of National milk production center around 205,000MT per year, most of which comes from cattle<sup>2</sup>. In 2007, the livestock population was estimated at 1.2 million head of cattle and 318,000, buffaloes. Milk cows and milk buffaloes number 533,000 and 108,000 respectively, suggesting an average annual milk yield of 300 liters per cow. However, given the difficulty of obtaining precise data, these estimates should be considered indicative rather than definitive.

In the early 70s local milk production covered 80% of Sri Lanka's consumption needs, but the open economic policy and a growing demand, resulted in a sharp increase in imports of mainly Full Cream Milk Powder (FCMP) and as of 2009 present local milk production covers only 20% of the national consumption. The large quantities of imported dairy products valued over LKR32 billion (USD 294 million) in 2008 represented about 2.1% of all Sri Lanka's imports in that year.<sup>3</sup> To reduce the drain on the country's foreign exchange resources, and support employment and family incomes in rural areas, the Government of Sri Lanka (GOSL) has set the ambitious target to reach at least 50% self-sufficiency in milk by 2015. This may be considered optimistic, but there is no doubt that the present conditions for milk production are more encouraging than in previous years.

Despite problems in the data, it is accurate to conclude that the present level of milk production can be increased through better management and improvement of livestock breeding practices including an expansion of the Artificial Insemination (AI) services. With the limited scale of AI services in relation to the total cow population (<12%-15%), the current number of productive cross-breeds is well below what it could and will be in the future. This means that Sri Lanka can expect average milk production per cow to show a gradual increase in line with the improvements in farm management, feeding, calf rearing, health care, housing and, last but not least, genetic quality. That, however, speaks only to the supply side of the dairy business. A viable dairy development program must take all these aspects into account and at the same time analyze the effective demand and markets for the increased volumes of marketable milk.

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<sup>1</sup> Sri Lanka Livestock Statistics 2002 and 2007, Ministry of Livestock Development.

<sup>2</sup> Neat cattle excluding buffalo cows.

<sup>3</sup> Central Bank of Sri Lanka Annual report 2008. Table 74 - figures for 2008 are provisional.

The income that farmers earn from their cows' milk depends on the market and on the collection and distribution systems for getting milk from the farmer to the consumer. At the centre of this process are the milk processors. There are two major (> 30,000MT per year) and a number of smaller processors in Sri Lanka that use fresh milk<sup>4</sup>. According to the Livestock Statistics, the formal dairy processing industry collected 120,762MT of raw milk in 2007, which is around 60% of the total estimated production volume (cattle and buffalo). If we look at the information provided by the processing companies, the total quantity may exceed this figure. In addition to the formal sector, there are a considerable number of small enterprise curd makers that also buy and collect milk. Curd is one of the most popular dairy products in Sri Lanka, consumed in both urban and rural markets by a wide range of consumers. The total milk going into curd production could amount to 70,000MT or even 100,000MT per year.

In most areas milk is collected once a day (only morning milk) because there is no proper cold chain and the loss of quality would be too high if evening milk was kept overnight without proper cooling. Only in the Central Province is milk collected twice a day, because this area has the highest density of producing dairy cows. Milk quantity, fat content and SNF (solids-non-fat) are the basic parameters for milk payment. Sampling and testing are done at the milk collection points (CPs). The total quantity of milk collected shows strong fluctuations according to season. This variation differs from region to region, according to the substantial differences in regional climatic conditions.

Based on a combination of data and interviews with processors, it appears that in 2007 the formal processing sector handled around 650,000MT of Liquid Milk Equivalents (LME) of which almost 80% consisted of imported milk powder. It is clear that the consumer has a strong preference for milk powder. If we look at the current prices for dairy products, we see that fresh pasteurized milk is slightly cheaper than UHT. Milk powder with water added costs around LKR90 per liter making it cheaper than fresh liquid milk. This price advantage, however, is dependent upon a tariff of LKR125 per kg on all imports of powdered milk. That tariff was increased in 2008 to encourage the domestic dairy industry. The LKR125 per kg is less than Sri Lanka's World Trade Organization (WTO) pledged rate of 28% (not-to-exceed rate) on imported milk powder. Compared to retail prices for milk powder in Colombo in July 2009, which ranged between LKR210 to LKR260 per 400 grams, the tariff represents roughly 19% to 23% of retail prices in large supermarket outlets. The higher tariff imposed by the government in 2008 has had the desired effect of raising the value of the domestically produced milk.<sup>5</sup> That higher price along with the end of LTTE extortion and hostilities has generated substantial private sector interest in investing in expanding milk collection in the North Central and Eastern Provinces.

Institutional support for the dairy and livestock sector comes primarily from the Ministry of Livestock Development, which is responsible for overall development of the livestock sector in

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<sup>4</sup> Here we consider Fonterra Brands Lanka a smaller buyer of raw milk, but a major player in the dairy sector through the imports and sales of milk powder.

<sup>5</sup> The tariff was increased to LKR145 per Kg in 2009.

Sri Lanka. The Provincial Ministries of Agriculture, Animal Production and Health are responsible for the local implementation of livestock development programs and projects. Their role has increased in recent years as a result of decentralization, but the provincial Ministries depend largely on the Central Government for their budgets, which typically contain only minor amounts of program funds. In practice, most of the field tasks are carried out by the Department of Animal Production and Health (DAPH), the main government institute for the technical leadership for livestock development. DAPH has its central office in Peradeniya and field offices in (almost) all districts of Sri Lanka. The other two major government organizations involved in the dairy sector are MILCO (Private) Ltd. (MILCO), a government owned dairy company and is the largest collector of raw milk in the country, and the National Livestock Development Board (NLDB) whose main task is development and distribution of good breeding animals. Through MILCO the government policy for fresh milk was implemented, partly by establishing the basic prices for raw milk and through the support programs for dairy development.

In general the institutional framework for supporting the livestock sector has changed little in recent years, and many of the conclusions in the FAO Final Report<sup>6</sup> remain valid. There are many dedicated, highly qualified staff doing their best to develop the sector, but progress has been marginal. Several factors have tended to undermine hope for achievements, including:

- Budget: government revenues are constrained and overstaffing is prevalent. Most funding is spent on salaries, leaving little for programs and less for service delivery;
- Focus: too many activities are undertaken and not enough attention is paid to the core, high priority problem such as breeding stock supply;
- Under-pricing: Providing low cost services deters the private sector from involvement such as AI services and retail ceilings on milk prices discourage investment; and
- Role of the parastatals: activities such as milk collection and processing and managing breeding farms are not necessarily tasks the government typically manages well. Doing jobs that could be left to the private sector diverts public resources from important assistance to farmers and consumers that the private sector typically cannot provide such as regulation enforcement, farmer and consumer protection, health and family welfare.

On the other hand some of the recommendations from the 2003 report have been successfully implemented. Importantly, institutes such as DAPH and NLDB are now setting production and performance targets. There is more attention for the economics and profitability of dairy farming and more attention to the role of the private sector in dairy development (stimulating the processing industry to invest more in milk collection through higher tariffs for milk powder and more market oriented price structures for raw milk).

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<sup>6</sup> Sri Lanka: Livestock Sector Development Action Plan, 2003.

A S.W.O.T. analysis of the dairy sector is presented in the report shows many weaknesses and serious threats and only a few strengths. Chief among the opportunities are the return of peace to the country, a price for milk that encourages investment in livestock for dairying, a surge of investment in new milk collection centers by processors and a growing interest among farmers in increasing their productivity. These developments coupled with improvements in livestock breeding, feeding, and care can create a more productive, more viable domestic dairy industry in Sri Lanka.

In the past years, a number of reviews and policy studies have been carried out, often with similar findings and recommendations to the FAO report of 2003. That report outlined a number of basic conditions have to be taken into account when formulating development policies, and endorsed a market-led approach as the only strategy that will lead to a sustainable increase in production and performance of the dairy industry. This implies, first of all, a consistent pricing with respect to key inputs and marketed animal products. At present Sri Lanka's pricing policies are less than fully consistent. The LKR125 per kg tariff on imported powdered milk was implemented to encourage domestic milk production. However, milk prices are also controlled by the state-corporation, MILCO, and powdered milk is also a product covered under the GOSL price control mechanism administered through the Ministry of Trade and Consumer Protection. Currently the price ceiling on milk is not a constraint to most milk producers, but the existence of price ceilings in law constitute a potential threat to the industry's development. With the context of a supportive tariff, however, government policy appears to be one of leaving investment and operations (development of collection routes, processing and marketing) open to private sector operators. Other key recommendations for the sector include:

- Focus the domestic dairy industry on supplying high value/high quality fresh products,
- Use the temporary protection afforded by the tariff on imported milk powder to improve the efficiency of raw milk collection, processing and marketing; also use some of the revenues to fund programs to increase local dairy industry productivity;
- Intensify the efforts to improve farm level productivity through improved profitability; and
- Re-focus the livestock sector institutions to their core service delivery functions so that their limited resources can be deployed in the most effective manner.

In addition, the report offers a number of technical recommendations aimed at increasing the production per cow, developing the marketing channels and stimulating the demand for fresh milk.

The end of the war opens the way to a number of development opportunities in the Eastern and North Central Provinces. Dairy development has made progress in the North Central Province and has great potential in the Eastern Province. Dairy development in the Eastern Province has an advantage of having the largest herds of animals in Sri Lanka; however, due to

prolonged conflict milk production has been limited. The dairy sector productivity should increase significantly in these provinces with good nutrition, housing, breeding, and intensive management practices.

During the initial period of dairy development, milk, which is potentially available, but not tapped can be, collected through the creation/establishment of a milk collection system and related services. MILCO and at least three private processors are currently investing in expanding or creating new milk collection routes that reach further into the North Central and Eastern Provinces. The next step will be investments in breeding and feeding practices that lead to a gradual increase in yield per cow. The increases in yields are sustainable if the milk price remains high enough to encourage farmers to reduce herd numbers and intensify their production system. This strategy calls for a long-term approach and consistent dairy policy. Social and cultural practices in the region, as well as environmental conditions, are unlikely to favor approaches based on drastic changes to traditional practices and systems.

# 1 Introduction

The USAID/CORE Program seeks to address the disparity in economic development between the conflict-affected Eastern Province (Ampara, Batticaloa, and Trincomalee districts in the eastern province) and conflict-bordering North Central and Uva Provinces (Anuradhapura and Polonnaruwa districts of North Central Province and Monaragala district of Uva Province) of the country and the rest of Sri Lanka. This approach uses value chains and their participants as a vehicle for promoting peace through economic development. At the center of sustainable development is the challenge of expanding and improving value chains in Sri Lanka within the conflict-affected and conflict bordering regions, so that grassroots producers can participate with mainstream businesses, and some, as a consequence, become entrepreneurs.

It is important to conduct a systematic, in-depth analysis of selected value chains to identify constraints and opportunities for project intervention to improve competitiveness of products and services. The objective of the present study completed in July 2009, was to identify opportunities and constraints within the dairy sector.

Meetings were arranged with the Livestock Ministry, dairy processing companies, input suppliers and others. Valuable information and reports were received that formed the basis for an understanding of the conditions and opportunities to develop milk production and processing in the target areas. Subsequently visits were paid to the North Central and Eastern Provinces to discuss dairy development with the representatives of the DAPH, PDAPH field officers, MILCO officials, milk collectors and farmers. The milk collection centres (MCCs), CPs and villages that were visited provided a very useful picture of the general conditions and the needs for structural dairy development.

The next pages describe the present conditions for dairy production and assess the options for sustainable development. Specific emphasis has been placed on dairy development in the Eastern and North Central Provinces, where almost half of the cattle can be found, and livestock production is an important economic activity. Based on the findings, recommendations were formulated to enhance the competitiveness of the sector/value chain and to create awareness and interest amongst private sector, public sector and donor communities.

## 2 Value Chain Overview

### 2.1 General Background

Sri Lanka has a total land area of 65,610 sq. km., and of this around 30% is agricultural land. Almost 75% of the agricultural land is under smallholdings and the balance under estates<sup>7</sup>. The number of smallholdings is at an estimated 1.8 million, with 90% smaller than 2 hectares. Some 70% of these smallholders are engaged in crop production only, while the rest practice a mixture of crop farming and livestock. Only a limited number of farmers depend solely on livestock.

In 2008, the agricultural sector contributed around 16.8 percent to the Gross Domestic Product (GDP), having dropped from 21.3 percent in 1998. The livestock sector contributes only 1.2 percent to the GDP, but is an integral part of the rural economy and provides draught power<sup>8</sup>, manure, meat, milk, and transport. The dairy sector can be considered the most important sub-sector of the livestock industry, because of its potential influence on the rural economy.

Livestock Statistics<sup>9</sup> show a steady growth in annual milk production (cows plus buffalo) during the 60s and 70s, but growth has stagnated since then. In 1986, the statistical data were re-calibrated, creating an anomalous marked decline in cow milk from around 250,000MT to 126,000 MT in that year. As shown in Figure 1, in the Livestock Statistics for 2007, a similar “re-adjustment” of production data has taken place, resulting in a decline in cow milk from 256,000MT to 147,000MT for 1998. Since then estimates of national milk production have increased again each year to the present level of around 180,000MT. Buffalo milk production was also re-adjusted and reduced from almost 80,000 MT to 30,000 MT in 1998 and is at an estimated 35,000 MT. This brings the total milk production for 2007 at around 205,000MT.

In 2007, the livestock population was an estimated 1.2 million heads of cattle and 318,000 buffaloes. Milk cows and milk buffaloes number 533,000 and 108,000, respectively. This roughly means an average annual milk yield of 300 liters per cow<sup>10</sup>. However, given the difficulties of obtaining detailed data, these key parameters (number of head or yield per cow per year) may differ from reality.

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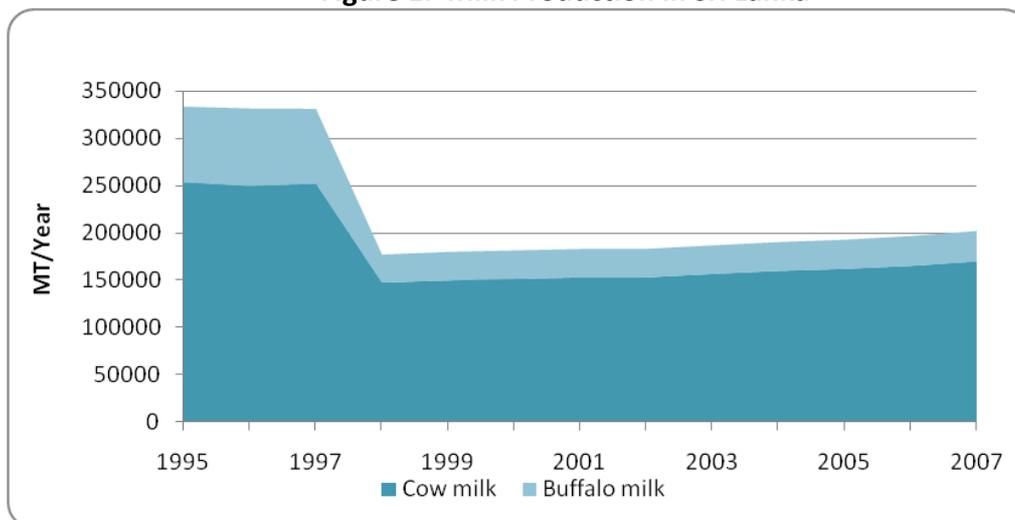
<sup>7</sup> Livestock Sector in Sri Lanka, a Profile, Ministry of Livestock Development, 2007.

<sup>8</sup> Animal draught power is useful for small and medium scale farmers with limited income: those who cannot afford to buy or hire tractors. Draught animals can be used for many purposes: mowing, ploughing, weeding, harvesting, transportation and pumping water. In Sri Lanka, cattle and buffalo are the main draught animals.

<sup>9</sup> Sri Lanka Livestock Statistics 2002 and 2007, Ministry of Livestock Development.

<sup>10</sup> Average annual milk yield in New Zealand is in the region of 3,000-6,000 liters per cow.

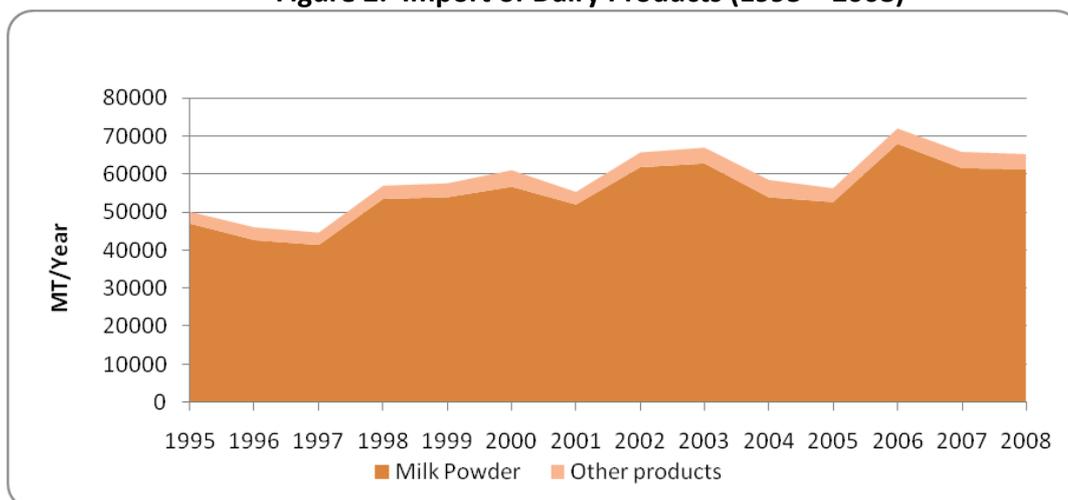
**Figure 1: Milk Production in Sri Lanka**



Source: Livestock Statistics, Department of Animal Production and Health, 2008.

In the early 70s local milk production covered 80% of the consumption needs, but the open economic policy and a growing demand, resulted in a sharp increase in imports of mainly Full Cream Milk Powder (FCMP). Figure 2 below shows in 2008 Sri Lanka imported LKR32 billion (USD 294 million) worth of milk and dairy products, about 2.1% of all Sri Lanka's imports in that year.<sup>11</sup> To reduce the drain on the country's foreign exchange resources, and support employment and family incomes in rural areas, the GOSL has set an ambitious target to reach at least 50% self-sufficiency by 2015. In view of past experience had, this could be considered too optimistic, but there is no doubt that the present conditions for increasing milk production are more encouraging than in previous years.

**Figure 2: Import of Dairy Products (1995 – 2008)**

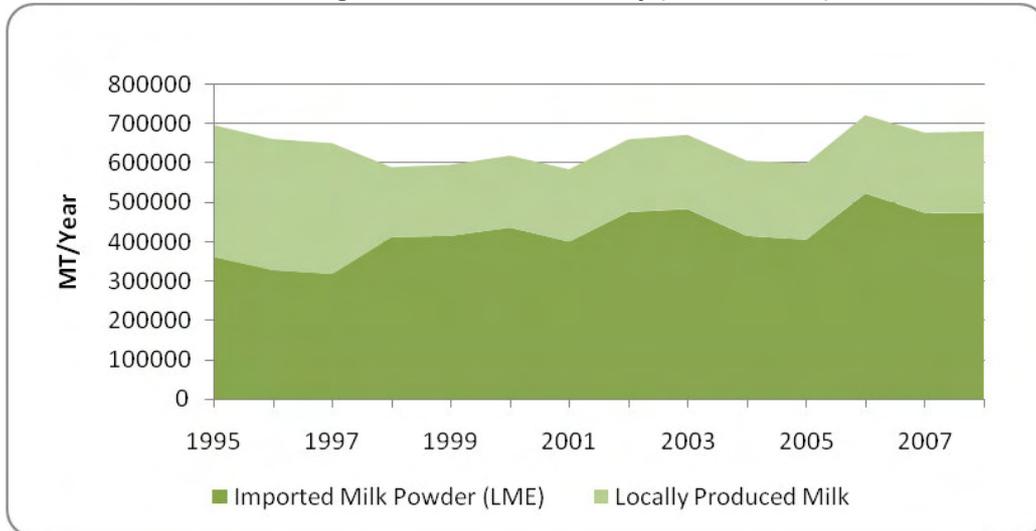


Source: Livestock Statistics, Department of Animal Production and Health, 2008.

<sup>11</sup> Annual Report 2008, Central Bank of Sri Lanka, Table 74. Figures for 2008 are provisional.

The figure 3 shows the combination of locally produced milk and the total imports show the total milk supply in Sri Lanka and the availability for consumption. In section 2.3, more details are provided on milk consumption.

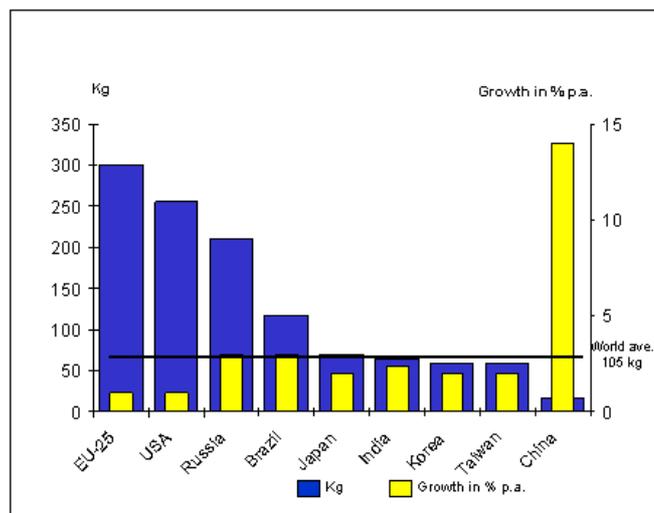
**Figure 3: Milk Availability (1995 – 2008)**



Source: Livestock Statistics, Department of Animal Production and Health, 2008.

Milk and dairy product annual consumption in Sri Lanka was estimated at 34kg Liquid Milk Equivalent (LME) per capita (93g per day) in 2008 (Department of Census and Statistics) which is well below the world average of 105kg LME/year, as can be seen from the figure below for 2004.

**Figure 4: Per Capita consumption of dairy products by selected countries**



Source: Rabo Bank 2004

## 2.2 Milk Production

### 2.2.1 Production Systems and Livestock Population

Based on rainfall pattern the country is divided in 4 main agro-ecological zones. As shown in Table 2.1, the largest populations of cattle and buffaloes are found in the dry and dry intermediate zones.

**Table 2.1: Livestock Population in 2007**

Livestock population 2007	Cattle	%	Buffaloes	%
Wet zone	148,690	12	54,850	17
Wet intermediate	130,960	11	27,970	9
Dry intermediate	383,900	31	133,850	42
Dry zone <sup>12</sup>	559,440	46	102,250	32
	<b>1,222,990</b>	<b>100</b>	<b>318,920</b>	<b>100</b>

Source: N.F.C. Ranaweera - Sri Lanka: Opportunities for dairy sector growth, 2008.

If we also consider altitude and production systems, the production zones as described by Ranaweera are very useful to obtain a general understanding of the dairy sector.

**Table 2.2: Milk production zones in Sri Lanka**

Zone features	Dry zone	Coconut Triangle	Mid-Country	Hill Country & Estates	Wet Zone & Urban
Location (Districts)	Ampara Batticaloa Jaffna Kilinochichi Mannar Mullaithivu Trincomalee Vavuniya Anuradhapura Polonnawura	Kurunegala Puttalam Gampaha	Kandy Matale	Nuwara Eliya Badulla	Monaragala Kegalle Ratnapura Kalutara Galle Hambantota Matara Colombo
Animal types	Indigenous cattle, zebu cattle and crosses, buffalo	Crossbred exotics, zebu cattle and crosses, buffalo	Pure and crossbred exotics, zebu crosses	Pure and crossbred exotics	Crossbred exotics and zebu, indigenous cattle and buffalo
Husbandry system	Large free-roaming herds and small/medium sedentary herds	Medium size herd, limited grazing, tethered under coconut	Small herds, Some tethering with stall feeding	Small herds, zero grazing	Medium or small herds, limited grazing & zero grazing
Average herd size	20 -200 or even more	5 cows	2-3 cows	1-2 cows	2-3 cows
Average yields	1 l/cow/day, 100-200 total	3 l/cow day, 300-600 total	4 l/cow day, 700-900 total	≥ 6 l/cow/day, 1300-1700 tot.	4 l/cow/day, 900-1100 tot.

Source: Ranaweera – Sri Lanka: Opportunities for dairy growth, 2008.

<sup>12</sup> The dry zone covers North Central and Eastern Provinces. Together these two provinces possess almost half of all cattle and one third of the buffalo population.

In the dry zone, the cattle generally are kept in large herds that graze natural pastures in scrub jungles, tank beds or post harvest crop fields. Concentrates are not fed. Most animals are of an indigenous breed, hardy but with a low production potential. In settlement areas the cattle are kept in the home plots. Lack of grazing lands and water is a common complaint of the cattle owners and a restriction to production improvement.

In the coconut triangle zone cattle are usually tied under or near the coconut trees during the day-time and kept in a shed or near the homes during night-time. Most cattle are minimally productive, indigenous animals but with better prospects for upgrading and improved management than cattle in the dry zone.

**Picture 1: Local cattle grazing in paddy field after harvest in Eastern Province**



Source: USAID/CORE

In the higher mid-country, farmers grow permanent crops, while in the lower areas they cultivate paddy. Through earlier breeding programs, the genetic potential of the cows here has already been improved and with improved management and feeding, further production increases are possible.

In the hill country where one finds most of the tea plantations, animals are stall fed on grass cut from roadsides and other places with natural grass. Concentrate feeding is common. Here the highest yields per cow are obtained as climatic conditions are favourable for exotic breeds and their crosses.

In the wet zone and urban areas the animals are reared in the home plots and where possible have access to crop fields after harvest.

The number of milking cows as part of the total herd is low. Lactation periods are short and the number of dry cows or unproductive cows is much higher than one would find on a best-practices dairy farm. This could be caused by the fact that milk is just one of the products and draught power, manure, social status and property are even more important to the farmer.

**Table 2.3: Average herd composition (1998 – 2007)**

Year	Cattle				Buffaloes			
	Milch cows	Other cows	Total herd	% milking	Milch buffalo	Other buf.cows	Total herd	% milking
1998	682	306	1,178	58	227	188	316	72
1999	690	304	1,191	58	236	183	319	74
2000	670	285	1,147	58	227	173	304	75
2001	673	285	1,153	58	228	162	290	79
2002	648	272	1,112	58	221	161	282	78
2003	489	207	1,138	43	96	70	280	34
2004	500	211	1,160	43	101	75	301	34
2005	510	215	1,185	43	104	77	307	34
2006	525	220	1,214	43	106	78	314	34
2007	533	220	1,222	44	108	79	318	34

Note: The downward adjustments made in 2003 are quite significant in the numbers and percentages of cows used for milk production.

Source: Livestock Statistics, Ministry of Livestock Development, 2007.

The difference between total herd numbers and cows is made up by bulls and calves. If we take into account that there also is a large number of cows recorded as 'not milked at present' that is included in the column for "Milch cows", then the percent of productive cows at a certain time in the year would be less than half of the percentages shown above. In the more extensive production systems of the Eastern Province the percentage of non-productive animals is higher than it is for cows kept in the hilly areas of the Central Province.

## **2.2.2 Animal Breeding and Genetic Improvement**

The regions of Sri Lanka show a large variation of phenotypes in cattle. They may have a hump or not, show a wide range of colours and vary in body weights. There is a wide variety of crossbred indigenous cows with temperate breeds such as Jersey and Friesian or Zebu breeds such as Sahiwal and Sindh. Australian Milking Zebu (AMZ) and Australian Friesian Sahiwal (AFS) are also popular breeds. In the buffalo population crossbred animals with Murrah and Nili Ravi is a common view. A breeding policy was designed in 1994<sup>13</sup> by a National Breeding Committee. These recommendations are still largely used.

In principle, there are two major government organizations involved in breeding and genetic improvement: DAPH and the NLDB. In addition, there are a small, but growing number of private sector inseminators.

DAPH operates three centers for reproduction: Kundasale (Central Province), Polonnaruwa (North Central Province), and Thinaveli (Northern Province). The main and central station is Kundasale, with a total production of more than 160,000 doses of frozen semen for cattle, buffalo, and goats. Polonnaruwa produces around 20,000 doses of frozen semen and Thinaveli produces an even smaller quantity of chilled semen. In addition some semen, mainly from Sahiwal and Murrah breeds, is imported. The semen that is distributed to the AI units at

<sup>13</sup> The National Breeding Policy Guidelines for Livestock in Sri Lanka, Ministry of Agriculture, 1994.

divisional veterinary offices not only give a clear indication of the preferred breeds, but also show that AI in cattle is far more common than in buffaloes.

**Table 2.4: Distribution of Semen in 2008 (Number of Doses)**

	Breed	Locally Produced	Imported
Cattle	Friesian	34,913	609
	Jersey	93,717	463
	Sahiwal	15,585	310
	Friesian-Sahiwal	19,676	0
	Jersey-Sahiwal	17,011	0
	AFS	520	85
Buffalo	Murrah	2,469	18
	Nili Ravi	4,041	42
Goats	Jamnepari	3,578	39
	Saanen	0	77
<b>Totals</b>		<b>191,510</b>	<b>1,643</b>

Source: Dairy Industry Statistics, Livestock Planning and Economics Division, DAPH, Feb 2008.

The total number of inseminations carried out in 2008 was 165,853. This was 8% below the target, but 3.5% more than in 2007. Sixty five percent of all inseminations took place in 3 provinces: NWP with 44,667, CP with 43,473 and WP follow with 20,855 inseminations. Looking at the cow populations in these three provinces, one can conclude that the majority of cows are bred through AI services. In the Eastern Province, with only 4% of all inseminations and the highest cow population, AI services are just developing.

The statistics do not mention the number of first inseminations, which would give a better indication of the number of cows served through AI. However, it seems practical to assume that at least 2-3 inseminations per cow are needed for conception. This would mean that some 60,000 to 80,000 cows are served in Sri Lanka, approximately 12% to 15% of the total estimated head of so-called milch cows.

The results of the AI services are difficult to assess as only 27% of the cows that have been inseminated were also checked for pregnancy. Calving records are scarce and do not provide a clear indication either. Fortunately, DAPH is aware of this problem and making efforts to establish a more reliable database.

The cost of semen production was calculated at LKR39.24 per dose (USD 0.35) and sold at an even lower price to the inseminators/farmers. Farmers pay varying amounts for the AI services, often related to transport costs and the demands of the inseminator. One farmer paid LKR 1,000 per insemination, but was very satisfied with the services and results, while another farmer paid LKR 300 per insemination, but needed 3-4 inseminations per cow to get them pregnant. A detailed special assessment of the effect of AI services (along with improved recordkeeping) is recommended to identify shortcomings and to make adjustments.

In 2008 a total of 116 persons were trained as AI technicians. The private sector participated with 79 persons, while the remaining trainees came from DAPH and NLDB. All AI training takes

place at the Polonnaruwa Training Centre. A Heifer Calf Rearing Program and a Milk Recording Program have been launched, but these programs still cover limited numbers of animals (4,389 calves, 734 cows) and their effect has not been assessed.

Natural breeding still is the most common way to get the cows in calf and to improve genetic potential of the cattle, buffalo and goat population. In cooperation with the NLDB, DAPH started a breeding program in 2004. Bull calves from the NLDB farms and from farms that are under Milk Recording are being distributed to local farmers. In 2008 this amounted to 59 buffalo bulls and 54 bull calves in 6 provinces. The main thrust, however, in distributing breeding stock should come from the NLDB breeding farms. The informal market is an alternative source of breeding animals. Although the extent of this market has not been assessed, general opinion is that it provides more animals than does NLDB. Alternatively, breeding animals would have to be bought through the private sector, but presently there are no cattle markets or any other form of coordinated demand and supply.

The NLDB was established in 1974 with the objective of serving as a Meat Marketing Board, but later took over the functions of breeding animals of improved genetic potential for distribution to farmers. The NLDB wishes to be the best self-sustaining organization in Sri Lanka to provide quality breeding material, livestock, and agricultural products to enhance the socio-economic standards of the Sri Lankan people through various activities in livestock and crop production. Their main function, however, remains the distribution of good breeding stock to the public. It was originally assigned nationalized estates, and in 1992 a further 20 farms were transferred from DAPH to NLDB. Two of these have been privatized under a 50-year lease agreement. Currently NLDB manages 29 farms and a Training Centre on 14,088 hectares. Many farms are coconut estates. The Mid-Country Livestock Development Centre (MLDC) is a training and demonstration farm with (very) small numbers of all types of livestock. In addition to the breeding farms for poultry, pigs, sheep, goats, rabbits, and quails, the NLDB manages the following major cattle and buffalo farms as shown in Table 2.

**Table 2.5: NLDB breeding farms**

Farm	Cattle				Buffaloes			
	Cows	Heifers	Bull Calves	Stud Bulls	Cows	Heifers	Bull Calves	Stud Bulls
Bopathalawa	362	413	21	4				
Parasangahawewa	247	350	111	8	15	50	14	2
Oya Maduwa	314	371	98	8				
Welikanda	289	315	36	7				
Polonnaruwa	177	39	25	1				
Nikaweratiya	214	250	13	5	81	77	21	3
Polonthawala	177	39	25	1				
Beligama	10	8	199	0				
Melsiripura	27	19	31	0	141	158	95	4
Rukkathana	162	127	64	3				
Marandawala	190	218	100	3	167	151	59	4

Farm	Cattle				Buffaloes			
	Cows	Heifers	Bull Calves	Stud Bulls	Cows	Heifers	Bull Calves	Stud Bulls
Narangulla	67	102	50	2				
Galpokuna	145	176	86	2				
Koulwema	173	210	91	2				
Andigama	267	312	86	6				
Seringhapathe	154	137	34	5				
Haragama	7	8	30	0	55	26	24	2
Dayagama	252	287	30	2				
Rediyagama	31	18	15	4	219	156	43	3
<b>Total</b>	<b>3278</b>	<b>3408</b>	<b>1145</b>	<b>63</b>	<b>678</b>	<b>618</b>	<b>256</b>	<b>18</b>

Source: NLDB Website - <http://www.nldb.gov.lk>.

The main task of the NLDB is the distribution of breeding stock and the table below gives a summary of the actual distribution of cattle and buffaloes.

**Table 2.6: Distribution of NLDB cattle and buffaloes, 2006 – May 2009**

Year	Cattle				Buffalo			
	Females		Males		Females		Males	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
2006	523	566	1018	579	138	83	261	127
2007	663	687	1049	471	83	138	261	127
2008	2009	1200	2023	1017	81	30	227	144
2009 *	323	172	353	118	0	0	0	0

Note: (\*) data only until May for 2009.

Source: National Livestock Development Board (2009).

In view of the total number of milking cows/buffaloes and heifers in NLDB herds, the number of breeding animals issued over the past years has been too low. The number of available heifers in the herd is far more than needed for NLDB's own cow replacement. Many more could be distributed. The question then arises: why has this not been done? All reports mention the lack of available breeding animals, but the availability appears large enough to support more distribution. NLDB could give a boost to the livestock and dairy sector by distributing more good breeding stock. All heifers not needed for replacement within NLDB's herd could be sold as pregnant heifers and more good bulls could be sold as stud bulls.

The breeding stock is sold on the basis of live weight, with premiums for genetic quality (based on performance of the dam or own lactation) and confirmed pregnancy. The prices vary from LKR130–160 per kg live weight depending on breed. For a pregnant heifer of a European breed (Friesian, Jersey or their crosses), with a dam producing more than 2,500 kg/per lactation, a farmer would have to pay at least LKR65,000. A young Sahiwal heifer, not pregnant and less than 1.5 years of age would cost LKR22,000.

In most cases, young animals of 1-1.5 year of age are distributed. This may have certain advantages (cheaper to buy for the farmer, lower rearing costs for NLDB), but a major disadvantage is that the new owner will have to wait until this cow becomes productive and can produce milk for revenue. In some cases, as we saw during farm field visits, the heifers had not delivered a first calf two years after the purchase because of the poor AI results. Such a situation is very discouraging for farmers willing to make a change in their production system and will be counter effective in promoting more intensive dairy farming.

**Picture 2: Heifers obtained at an early age and still not pregnant after two years of AI services; owner is investing in new technology that provides no income so far**



Source: USAID/CORE

### **2.2.3 Animal Nutrition and Fodder Supply**

The scarcity of animal feed has been identified as the principal cause for the slow growth of the dairy industry in Sri Lanka. The seasonal variation in the supply of native grasses, roughages, the relatively high cost of compound feeds and common concentrated feeds such as coconut poonac, rice bran and sesame cake are major limitations for use by the rural, semi-urban and urban farming systems and not practiced at all under the existing extensive or free range cattle management systems in the Eastern and North Central Provinces.

Grazing opportunities for ruminants in Sri Lanka are limited. During the rice cultivation seasons, the animals are driven to distant scrub jungles and are allowed to return to graze on rough stubble on fallow paddy lands. Despite the lush growth of pasture grass during the wet season, few animals obtain the required nutritional levels because most fields cannot be used due to inundation. During the dry period, the lack of grass and water makes milk production unprofitable. However, even under these conditions, owners will still keep non-lactating animals in the herd for their sale value. Though not producing, an excess animal can still be sold for good cash if-and-when needed. This explains the rather high percentage of non-producing animals maintained by local dairy farmers in the North Central and Eastern Provinces.

In addition, scarce water resources are a severe limitation to animal production. These restrictions are caused by many reasons, such as expanding agriculture, human settlements, wildlife protection, industrial development, climatic change and the wartime security problems.

Available crop by-products such as rice straw, maize stover and sugar cane tops are not used to their full extent. A better integration of crop-livestock should be possible. Although there *are* cattle already kept under coconut trees; the quality of the fodder can be improved and increased. The combination of sugarcane with dairy farming looks very promising, and Pelwatte Dairy Industries has started to develop this integrated system further. Rice straw, if chopped and mixed with a bit of concentrates and fresh fodder, can support dairy cows. Each region will have its specific resources that need to be identified and put to proper use.

**Picture 3: A model farm in Pelwatte, Sri Lanka where an integrated system of dairy farming and sugarcane production is promoted. The new barn design, however, could be improved**



Source: USAID/CORE

Compound feeds are being produced, but their use is limited in dairy production. Most of these feeds are sold to poultry and pig farmers. The prices for dairy cattle feed varied:

**Table 2.7: Dairy Cattle Feed Pellet Prices**

Producer	Price LKR per Kg		
	2007	2008	2009
CIC Feed Ltd	27.8	32.90	35.00
Ceylon Grain Elevators Ltd	27.8	32.84	35.20
Bernard's Animal Feed	33.6	32.40	20.50
Gold Coin Feed Mills Ltd	25.2	20.32	34.12
Pelwatte Dairies	-	-	26.00

Source: USAID/CORE consultant's communication with companies.

In March 2009 Pelwatte Dairy Industries opened its new feed mill (capacity 40 t/shift). The feed will be sold to their milk suppliers as well as to other interested customers. MILCO also supplies compound feed to its suppliers. Both companies regard the supply of compound feed as an additional service and sell the feed without profit margin. Other dairy companies purchase

compound feed in bulk and pass on some of the discount to their farmers/suppliers, thus the cost of compound feed is kept below LKR20 per kg. With a milk price of around LKR30 per kg, this is an attractive option to increase milk yields.

Valuable research results are available on the use of non-conventional feed resources, concentrates, improved pasture & fodder varieties and the best practices on husbandry management under dry zone and hot humid conditions. However, farmers have as yet failed to adopt these findings. An important reason has been that the price for raw milk was too low, until recently, to stimulate farmers to invest in more intensive production systems. This was aggravated by the absence of effective farmer training programs and the absence of extension messages broadcast through mass media.

Close monitoring and making sure that recommendations on farm management and animals' nutrition actually result in higher yields and profits is essential. This also requires greater farmer involvement and participation in research and extension activities, a good understanding of the present farming systems and the development of practical and simple technologies that can be easily adopted by farmers. A change in farmers' attitude and behavior will also require a consistent and supportive government policy.

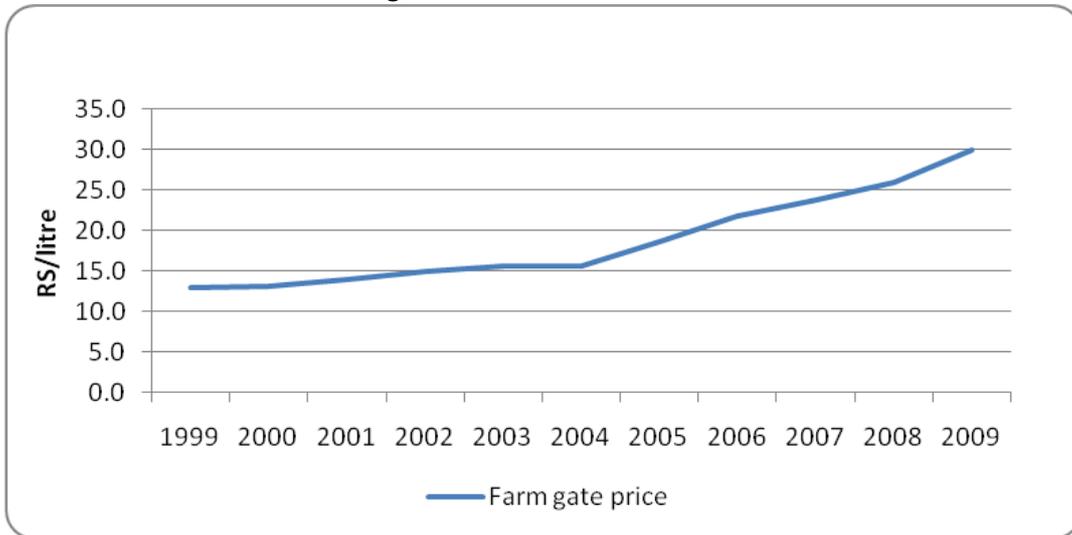
Efforts to improve fodder production and animal nutrition have shown good technical results with individual farmers, but the financial returns have not been sufficient to encourage sustained or widespread adoption. When technical success is not financially remunerative, farmers who experiment with better practices become discouraged and stop making the extra effort and incurring the added expense of the better practice. Without visible financial success, the new practice is less likely to spread by example and imitation to other farmers. As a result, overall impact is limited. The lack of financial incentives was especially true in Sri Lanka before 2008 when the tariff on imported powder milk was raised from LKR15 per kg to LKR125 per kg. Efforts to improve animal nutrition should be integrated in a holistic approach to livestock development, taking into account markets and sustainable prices.

#### **2.2.4 Profitability of Dairy Farming**

For many years, dairy development in Sri Lanka has been constrained by the vicious cycle of low productivity and low profitability. The low productivity of the cows and small-scale operations resulted in a relatively high unit cost for milk. This meant a low volume of sales, thin margins and low profitability, which in turn meant little or nothing to invest to improve productivity. Farmers were not able or motivated to invest in raising their cows' productivity, and the milk processing industry was left facing high costs for collecting a fairly low quality and quantity of raw milk.

The state control of raw milk prices and milk powder to protect consumers was a further disincentive to investment and development. The government still determines the raw milk price through MILCO, a state owned milk processing company and the largest buyer of raw milk.

**Figure 5: Raw Milk Prices 1999 - 2009**



Source: Livestock Statistics, 2007.

It is only in recent years that the raw milk prices have increased to a level that is becoming more economically attractive for farmers and processors. If we look at the behaviour of raw milk prices in Sri Lanka and other Asian countries for 2005-2008, we see that Sri Lanka had the smallest price increase in a period when the world market prices for milk were soaring and then collapsing. The price for FCMP rose from USD 2,000 in 2003 to a peak of USD 5,000 in early 2008 and dropped again to USD 2,000 in early 2009.

**Table 2.8: Milk Price Developments 2005 - 2008**

Country	2005 (USD)	2008 (USD)	% Increase
Malaysia	32.3	63.3	96%
Thailand	30.3	57.1	88%
Vietnam	20.2	46.5	130%
Indonesia	18.7	32.6	74%
Australia	21.5	40.0	86%
Sri Lanka	20.0	25.5	27%

Source: Business Management for Tropical Dairy Farmers, 2009.

At present raw milk prices in Sri Lanka vary from LKR26–35/L. (USD 0.23-0.30/L), depending on composition (fat and SNF), location and dairy company. Middlemen and traders often pay less to farmers, and both government and the dairy companies are making efforts to reduce the influence of middlemen. This is being done by establishing new milk collection centres routes served directly by the dairy processors. Another measure has been to encourage the establishment of the Farmer Management Societies (FMS). Also, the highest farm gate price for milk encountered during research for this report was, LKR45 per litter paid by a local curd processor in the Eastern Province who collected 2,500 l/day in the peak season. This shows an exceptionally strong local, if informal market.

**Picture 4: The local curd producer collects 2.5MT per day during peak season and sells his product for LKR90 per Kg. There may be hundreds of similar small processors**



Source: USAID/CORE

A valuable effort was made by DAPH to calculate production cost and profits for raw milk under different production systems<sup>14</sup>. The table below is an excerpt from that survey:

**Table 2.9: Cost & Profit of Milk Production under Different Management Systems**

Farming system <sup>15</sup> :	Intensive	Semi-intensive	Extensive
Sample size:	218	307	98
Production costs in LKR/litre milk			
Feed (concentrate & minerals)	8.23	7.89	3.40
Labour (own & hired, all farm work)	17.22	11.13	6.85
Veterinary services & breeding	0.97	0.85	0.25
Others (e.g. ropes)	0.87	2.25	0.35
Total variable costs	27.29	23.92	10.85
Fixed costs (shed & equipment)	0.51	1.8	0.01
<b>Total costs per litre milk</b>	<b>27.80</b>	<b>23.92</b>	<b>10.86</b>
<b>Average farm-gate price (LKR/L.)</b>	<b>28.25</b>	<b>30.50</b>	<b>31.10</b>
Average number of cows/farm	1.8	2.6	5.6
Average yield/cow/day	7.9	4.8	2.5
Average production litres/farm/day	14.2	12.4	13.9
<b>Average profit/day/farm</b>	<b>6.39</b>	<b>81.59</b>	<b>281.33</b>
<b>Average family income/day</b>	<b>250.91</b>	<b>219.60</b>	<b>376.55</b>

Source: Livestock Planning & Economics Division, Peradeniya, DAPH.

<sup>14</sup> Livestock Statistical Bulletins Volume 1 2008 and Volume 2 2009, Annual Report 2008.

<sup>15</sup> Intensive- stall fed; Semi-intensive- partly stall fed and partly either tethered to a tree or free grazing; Extensive - free grazing.

In all three systems, the farmers make a (slight) profit on dairy farming, but the extensive system appears to be the most profitable. Even when labour costs are included as family income, the extensive model returns the highest total income to the family. If land is limited and there are no alternatives for employment, then the more intensive systems still provide an opportunity to generate income that pays for the added labour.

The intensive system, based on zero grazing, fodder production and concentrate feeding works only when the farmer can invest in better feeding, higher genetics through (effective) AI services, improved housing and good health care. The present margins are barely enough to make these investments, but if we look at feed costs (LKR8.23 for 1 litre of milk), it seems that almost 0.5kg concentrate is needed to produce this litre. With higher volumes of good quality fodder, this could easily be reduced. Cutting grass from roadsides and other public places takes more time than harvesting your own crop. If land is available (which may not always be the case), investments in fodder production and conservation would reduce labour costs and increase milk yields.

The semi-intensive system allows for daytime grazing of the animals, thus reducing labour costs for the cutting and carrying of fodder. Apparently, these farmers have animals of a lower genetic quality, as feed costs are very similar. Otherwise, the feed intake from roughage is lower as a result of extensive grazing. Increasing the production potential of these cows and their feed intake would not only improve peak yields, but also total milk yields per lactation.

The extensive system may seem attractive economically at first, but the approach faces serious problems in the long run as water resources and grazing areas become increasingly scarce. As early as 1996, there was an article in the *Peoples Bank Economic Review* on the crisis of dairy farming,<sup>16</sup> whereby grazing lands and small water-tanks were reduced as a result of development activities (irrigation systems and settlement projects) and the cattle owners are being made responsible for any damages to crops or irrigation canals. Reducing herd size, promotion of herd quality and integration of crops and livestock are the necessary steps towards dairy development. These changes will take time and meanwhile immediate action is needed. Government land, suitable for grazing, could be allocated to farmers. At the same time extension, work has to take place to increase the yields per cow before the number of cows can be reduced.

### **2.2.5 Conclusions**

In most Asian countries, the dairy sector has shown a positive development, even during recent years with fluctuating prices for milk powder and raw milk. In Sri Lanka the available data show a very modest increase, but with some concerns with regard to reliability of the figures.

Despite problems in the data, it is accurate to conclude that the present level of milk production can be increased through better management and expansion of artificial

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<sup>16</sup> Peoples Bank Economic Review Sept/Oct. 1996 – Milk: Emerging Issues of the Industry.

insemination services. Available data do not indicate the number of cows that already have a higher genetic potential for milk production, but we may assume that with the limited scale of AI services in relation to the total cow population (<12-15%), the current number of productive cross-breeds is well below what it could and will be in the future. This means Sri Lanka can expect average milk production per cow to show a gradual increase, in line with the improvements in farm management, feeding, calf rearing, health care, housing and, last but not least, genetic quality. That, however, speaks only to the supply side of the dairy business. A viable dairy development program must consider all these aspects and at the same time analyze the effective demand and markets for the increased volumes of marketable milk.

As with any business, supply and demand work together to influence producer or farmer decisions. The demand for AI services to obtain cows that are more productive is closely linked to the market for dairy products. For many farmers, new cross-breeds that need better feeding and management than local cows, are useful only when they generate additional income through increased sales of milk. A similar response can be seen in attempts to improve fodder production as extra investments in feed have to result in higher incomes through marketable products, failing which farmers will decline to invest in these practices.

This brings us back around to the threat of the “Vicious” cycle again. Efforts to improve the genetic potential and to develop markets will fail without addressing the problems in animal feeding. The low growth rates and production levels are directly related to the feeding standards. Without changing animal nutrition, no production improvement can be achieved.

## **2.3 Milk Collection**

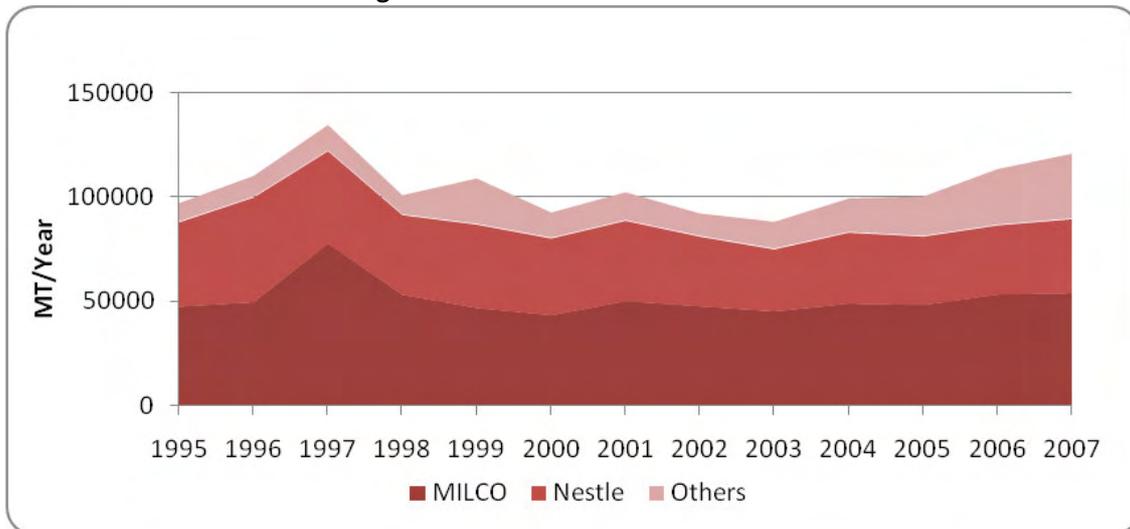
The income that farmers earn from their cows’ milk depends on the market and on the collection and distribution systems for getting milk from the farmer to the consumer. At the centre of this process are the milk processors. There are two major (> 30,000MT per year) and a number of smaller processors that collect and use fresh milk<sup>17</sup> in Sri Lanka. The official data for 2006 and 2007 include all major processors and are therefore likely to be more accurate than for previous years. In general, the data show that milk collection has remained stable over the past 15 years.

According to the Livestock Statistics, the formal dairy processing industry collected 120,762MT of raw milk in 2007, which is around 60% of the total estimated production volume (cattle and buffalo).

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<sup>17</sup> Fonterra Brands Lanka is a relatively smaller buyer of raw milk, but a major player in the dairy sector through the imports and sales of milk powder.

**Figure 6: Milk Collection 1995 -2007**



Source: Livestock Statistics, 2008.

For many years, MILCO and Nestlé have been the main companies involved in milk collection, together they are responsible for 75% of the total volume (45% and 29% respectively). MILCO’s share has been gradually growing, while Nestlé slightly reduced its milk collection efforts. A key reason is that the costs of developing a reliable milk collection network are substantial, while there always is the risk of losing the return on this investment to a competing processing company that pays a few rupees more to lure away a successful beneficiary of the other firm’s network and outreach programs. Other stakeholders in the formal processing industry that collect raw milk are listed below with the quantities of milk they presently collect:

**Table 2.10: Other Stakeholders Collecting Raw Milk**

Company Name	Total Milk Collection (MT per year)
Lucky Lanka Dairies Ltd	5,110
Ceylon Cold Stores (Elephant House)	4,015
Fonterra Brands Lanka Ltd	10,950
Kotmale Swiss Cheese Company Ltd	9,125
Lanka Dairies Ltd (Ambewela)	2,190
Noorani Estates Ltd (NEL)	3,285
Rich Life Ltd	2,190
<b>Total milk collection “Other Companies”</b>	<b>36,865</b>

Source: Verbal information from each company (based on daily averages).

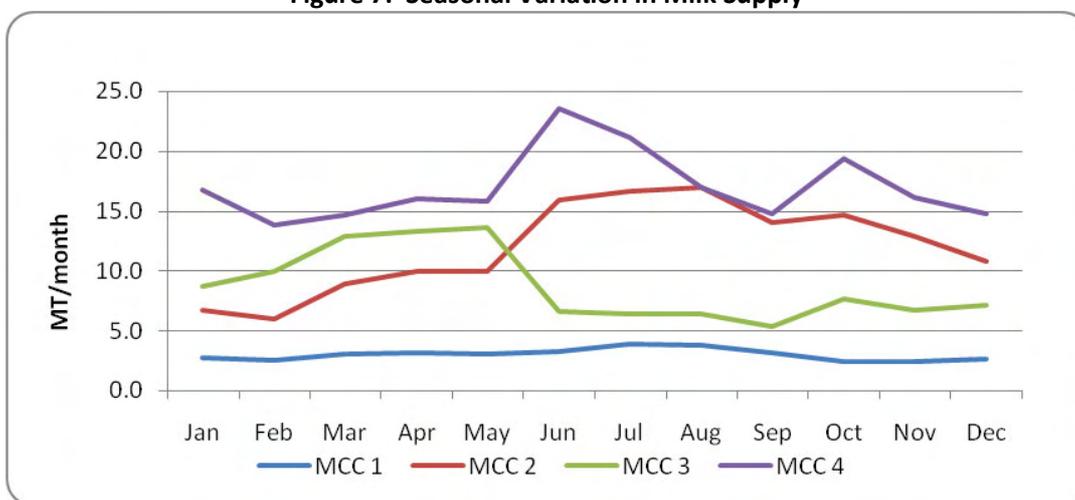
In addition to the formal sector, there seems to be a considerable number of small, local curd makers that collect milk. Curd is one of the most popular dairy products in Sri Lanka, consumed in both urban and rural markets by a wide range of consumers. It is difficult to estimate the number of curd makers, but this may easily reach several hundred. Assuming each producer collects an average of 1-2 tons of milk per day, the total milk going into curd production could amount to 70,000MT or even 100,000MT per year. As curd is mainly made from buffalo milk,

this may indicate that the production of buffalo milk is higher than estimated. Alternatively, curd could be made of mixed buffalo and cow milk, which would be more in line with the statistical data. Home consumption is said to be limited to some fresh milk in the morning tea in the rural areas and some is used on special religious days as offerings.

In most areas milk is collected once a day (only morning milk) as there is no proper cold chain and the loss of quality would be too high if evening milk was kept overnight without proper cooling. Only in the Central Province is most milk collected twice a day as this area has the highest producing dairy cows. Milk quantity, fat content and SNF (solids-non-fat) are the basic parameters for milk payment. Sampling is done at the milk collection points (CPs) and Rezazurin tests (10 minutes) and alcohol and/or density tests are then carried out at the chilling centres (MCCs). Failing these tests, the milk can be rejected.

The total quantity of milk collected shows strong fluctuations according to season. This variation differs from region to region, as there are substantial differences also in climatic conditions. Normally the calving period coincides with the better availability of fresh fodder and in that period most of the milk is collected. As this often is more than required, the milk either has to be processed into milk powder or UHT milk. Not buying all the milk in the flush season may result in losing suppliers to the competition, and none of the dairy plants is eager to take that risk. In the off-season, there is a severe shortage of milk as many cows are dry and feed is scarce. The graph below shows actual variations in milk collection for four Milk Collecting Centers (MCCs) in different locations in the Western and Central Provinces.

**Figure 7: Seasonal Variation in Milk Supply**

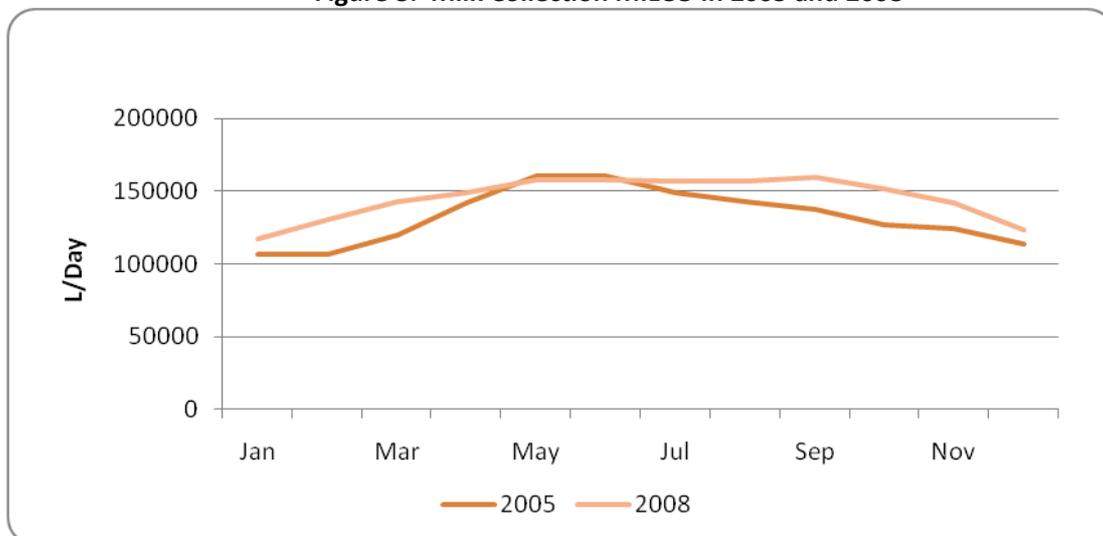


Source: Interviews with milk processing industry.

The smallest MCC (1) showed the least variation. Here cows are kept under a fairly intensive system and with a regular supply of feed and water.

Data provided by MILCO for their total milk collection also shows the influence of weather conditions. 2005 was a year with little rain, while in 2008 the weather was more favourable for crop and fodder production. This is reflected in the milk collection figures.

**Figure 8: Milk Collection MILCO in 2005 and 2008**



Source: MILCO, 2009.

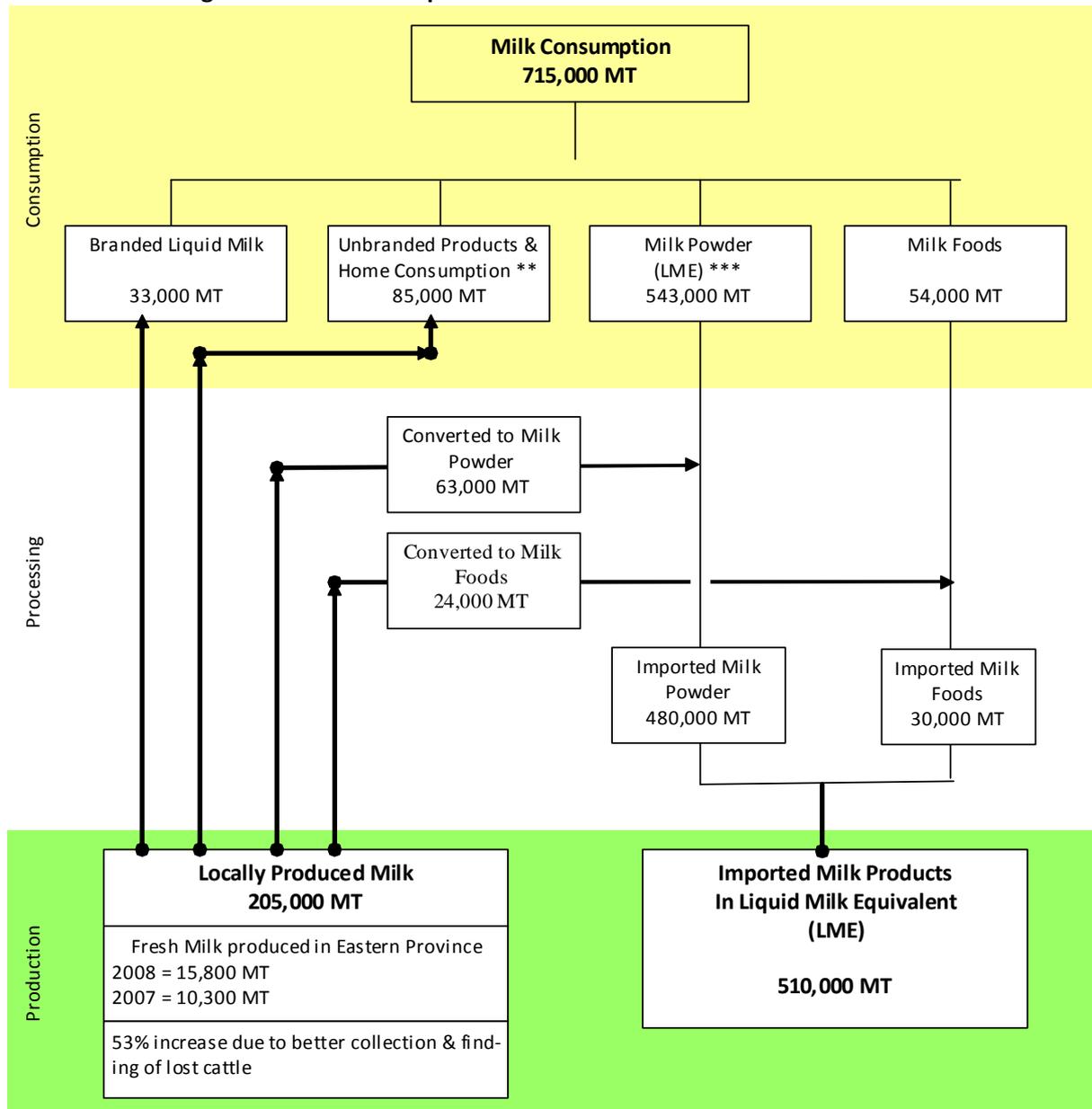
Because the dairy plants have to be able to operate their processing capacity efficiently and have to produce enough dairy products to meet the demand of their customers throughout the year, this seasonal variation in raw milk supply is a serious challenge. It acts as a constraint on the scale of plant that can be built and operated in a reliably continuous fashion. However, the smaller the processing plants the less power it has to use economies of scale to lower processing costs.

Growing production levels through improved feeding and higher genetics will make it necessary to start collecting milk twice per day, or at least it has to be assured that all surplus milk can be collected through proper cooling and storage at the village level. This is already the case in the Central Province, but in areas with extensive systems of milk production, where cows are only milked once a-day, this should not be given the highest priority because of current infrastructure limitations that would lead to production losses.

## 2.4 Milk Processing and Marketing

Rough calculations show that in 2007 the formal processing sector handled around 650,000MT of Liquid Milk Equivalents (LME) of which almost 80% consisted of imported milk powder. The remaining 80,000MT – 100,000MT is fresh milk processed by the informal, local processors or consumed at home. The chart below provides the estimates for milk consumption and production for 2007.

**Figure 9: Milk Consumption and Utilization of Milk Resources in 2007**



Source: Consultants calculations based on multiple sources

The branded liquid milk can be split into UHT milk (12 m liters) and pasteurized or sterilized milk (21 m liters). The unbranded liquid is used for curd processing, home consumption and other small scale processing. Milk foods (imported and locally produced) consist of ice cream (20,000MT), yoghurt (13,000MT), curd (8,000MT), condensed milk (13,000MT) and others (2,000MT)<sup>18</sup>.

<sup>18</sup> Department of Census and Statistics, 2007.

If we look at the total consumption of milk and the per capita consumption (PCC) of the various products, the statistics give the following breakdown:

**Table 2.11: Per capita and total consumption of different dairy products 2007**

Product	Unit	Monthly PCC	Annual PCC	Total 20 million Persons
Cow milk	ml	63.99	767.88	15,357,600,000
Goat milk	ml	0.75	9.00	180,000,000
Sterilized milk	ml	4.18	50.16	1,003,200,000
Curd	LKR	6.65	79.80	1,596,000,000
Yoghurt/ Moru	LKR	6.60	79.20	1,584,000,000
Condensed milk	g	1.62	19.44	388,800,000
Milk powder	g	354.39	4,252.68	85,053,600,000
Infant milk powder	g	23.40	280.80	5,616,000,000
Butter	g	6.15	73.80	1,476,000,000
Margarine	g	12.67	152.04	3,040,800,000
Cheese	g	2.25	27.00	540,000,000
Milk packets (liquid)	Nos	0.05	0.60	12,000,000

Source: Department of Census and Statistics, 2007.

Figure 9 earlier indicated that the Sri Lankan consumer buys and consumes more milk powder than fresh milk. The strong preference for milk powder is based on four factors: (1) economic value, (2) ease of storage, (3) Hygienic and uniform quality plus (4) acquired tastes for particular brands. Informal research – visiting retail supermarkets in Colombo - was used to prepare the table below of retail prices for selected milk products in Colombo in July 2009. At this time, the import levy on powder milk was LKR125 per kg. Subsequently, the levy was increased to LKR145 per kg. Appendix A contains tables showing a sampling of prices made after the Ministry of Trade and Consumer Affairs announced reductions in the price ceiling for powder milk on July 16, 2009. The gazette ceiling prices from powder milk in Sri Lanka as of July 20, 2009 ranged between LKR245 for a 400-gram package and LKR600 for a one-kilo package. Some of the milk prices found in the stores still carried a price of LKR260 per 400 grams printed on the package and possibly stocked before the new ceiling took effect. Newspaper accounts mentioned a LKR15 price reduction for the 400-gram package and an LKR37.5 reduction for the 1-kilogram package. In general, fresh pasteurized milk was selling retail price of about LKR120 per liter. UHT milk packaged in Sri Lanka was selling for between LKR120 and LKR190 per liter depending on the brand. Milk powder (converted into equivalent liquid liters) was selling for around LKR90 per liter, 25% - 45% less expensive than most fresh liquid milk.

## **2.5 Institutional Support**

Institutional support for dairy industry comes primarily from the Ministry of Livestock Development, the ministry responsible for overall development of the livestock sector in Sri Lanka with the mandate to formulate policies, programs, projects and allocates resources to develop the sector. Another important task is the coordination with other ministries and to obtaining external support for livestock development. The annual budget for the Ministry of Livestock Development was mentioned to be USD 10 million, of which 70% is used for salaries and offices. Only USD 3 million thus remains available for livestock development programs and projects. The state income from milk powder tariffs is as much as USD 70 million.

The Provincial Ministries of Agriculture, Animal Production and Health are responsible for the implementation of livestock development programs and projects. The provincial Ministries depend largely on the Central Government for their budgets. While their role has increased in recent years as a result of decentralization, most of the field tasks are carried out by the Department of Animal Production and Health (DAPH), the central government agency for the technical leadership for livestock development. DAPH has its central office in Peradeniya and field offices in (almost) all districts of Sri Lanka. DAPH has 5 technical divisions and 2 support service divisions. The main tasks of DAPH are:

- Provision of Animal Health Services
- Prophylactic vaccinations
- Curative Services
- Disease Diagnostic Services
  - Provision of Veterinary Extension Services
  - Farmer Training
  - Breeding Services
- Supply of Livestock Breeding Inputs
- Fodder Development
- Strengthening of Farmer Organizations

The DAPH staff includes 350 Veterinary Surgeons (VS), almost 600 Livestock Development Instructors and the veterinary and technical staff at the 6 Disease Investigation Centers and the Research Institute. The Annual Reports of DAPH provide a detailed description of their activities. The other two major government organizations involved in the dairy sector are MILCO and the National Livestock Development Board, which are presented in detail in section 2.1.2.

MILCO is a 100% government-owned company and is the largest collector of raw milk in the country. Through them, the government policy for fresh milk was implemented partly by establishing the basic prices for raw milk and through the support programs for dairy development. Based on the Indian (Amul) experience, MILCO introduced similar support

services to farmers, including insurance and social support schemes. Other dairy companies again copied this example, which helps to explain the apparent uniformity of designs and approach to dairy development in Sri Lanka.

In addition, there are the Mahaweli Authority (under the Ministry of Irrigation and Water Management) and the Samurdhi Authority (under the Ministry of Samurdhi). Both authorities are involved in dairy development programs and livelihood improvement of the rural population.

Universities (e.g. Sabaragamuwa, Ruhuna, Rajarata, Waymba, & Peradeniya) and specialized training institutes provide degree-level and non-degree level training on livestock production and veterinary medicine. There are various regional livestock training centres under the Provincial Department of Animal Production & Health and training facilities exist in most provinces. The School of Animal Husbandry at Seppukulama in NCP is perhaps the only state institution that offers a one year Diploma Course in Animal Husbandry and the entry requirements are highly competitive. The Hector Kobbekaduwa Agrarian Research and Training Institute, in Colombo, conducts field research, provides farmer training and conducts benchmark studies on the socio-economic situation of rural farmers. The training activities are *subjected* to the allocation of (government) funds. Non-Governmental Organizations (NGO's) and donor organizations have funded training programs for farmers and are still involved in these programs. The absence of well-designed demonstration farms at district level is a constraint for practical training as is the lack of funding for the professional development of subject matter specialists. More (practical) training of trainers and of farmers is needed, for which improved facilities and funding is required.

A multitude of NGOs contributed to livestock development and are still active in the establishment of new milk collection centers, farmer training and other support services. Their work is often coordinated with the milk processing industry. Some of these organizations include:

- Sarvodaya Movement
- Agromart Foundation
- Seva Lanka
- Gami Seva Sevana
- World Vision
- World Concern

A number of local and international NGO's are active in the Eastern and North Central Province. Prominent among them are World Vision with programs that assist farmer-owned milk co-operative societies to develop milk collection facilities. They have also provided small-scale milk chilling units (500L capacity) to collecting points in several rural villages of the East & NCP. World Concern is working more in the Eastern Province, also providing chilling units and assisting with development collection. These NGOs are expected to be active in both the East

and NCP at least through 2010. Some local cooperatives do a limited amount of their own processing and marketing (e.g. flavored milk, yoghurt) and sell any excess milk to MILCO.

The Department of Cooperative Development has pioneered the cooperative movement in Sri Lanka since World War II, promoting participatory enterprise efforts among farmers. During the past 3 decades, 235 dairy farmer cooperatives were established in the milk-shed areas of the country. At present 18 registered Milk Producer Cooperative Societies are functioning of which 3 are, multipurpose cooperatives and 15 are milk producer cooperatives with 75,600 dairy members. The executive committee members of each society are united under the apex body registered as the Sri Lanka Milk Producer Cooperative Federation Ltd known as MILKFED. The main focus is to uplift the in country milk production, strengthen milk producer cooperatives, motivate participatory efforts of farmers, value addition through milk processing and improve child and adult nutrition. The cooperative program has produced mixed results based on the leadership of each society. Specific cooperatives would benefit for improving their capacity to serve members. In general, the cooperatives reach the poorest of the rural poor in areas not served by other institutions.

A final, very important support institution is the financing system, the banks and Credit Suppliers for the livestock sector. Although many banks offer credit facilities, the names mentioned most often by farmers were those of the Bank of Ceylon and the People's Bank. In most cases, the dairy companies are providing the guarantees for loans through milk collection and payment. Interest rates vary from 8% to 20%. Repayment and grace periods also vary. Most loans seem to be used for the purchase of dairy cows with a higher genetic potential (with location determining what breed is most suitable).

In 2008, the Government took several policy decisions to develop the dairy sector on a priority basis<sup>19</sup>. Among them was the Agro-Livestock Development Loan Scheme (ALDL) designed to disburse LKR5,000 million through participating Financial Institutions (PFIs). At present 13 district banks are active in fund disbursements for small farmer dairy projects and for large-scale milk and crop processing companies. These processing companies should have forward contracts with at least 1,000 small farmers to purchase milk and provide services to be eligible for this scheme. Their 2008 target for the loan scheme was to reach 6,000 farmers.

The program aims to finance the whole value chain and addresses credit constraints for poor extension services, farmer training (trainers are reimbursed for training a minimum of 10 farmers per session), use of veterinary services & drugs, cultivation and transport of fodder (in case of dairy farming), construction of bio gas units and other requirements recommended by the government veterinarian, the processing of liquid milk & production of dairy products and increasing storage facilities in the processing industry. The acquisition of the condensed milk factory of Nestlé Lanka in Polonnaruwa, NCP by MILCO was also done under this scheme.

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<sup>19</sup> Central Bank Annual Report 2008.

Other policy measures in the ALDL scheme include increasing the penalty for the illegal slaughter and transport of cattle to LKR50,000, increasing the special commodity levy (SCL) on imported milk powder from LKR5 to LKR15per Kg and the allocation of funds to assist institutions dedicated to eradicate the slaughter of milking cows at rural level, strengthening the development of AI services and the distribution of studs for natural services, distribution of almost 9,000 improved female heifers under the heifer calf rearing scheme and establishment of new veterinary investigation centers (Ampara, Trincomalee, Hambantota, Kegalle, Matale, Nuwera Eliya, Homagama) to ensure better institutional support. An assessment of the fund disbursement from the Central Bank revealed that to date 5900 disbursements have been completed through the participating banks. The demand is high from small farmers as well as private sector companies. However, rural farmers in the East interviewed for this study knew little of this new facility.

It can be concluded that in general, the institutional framework for supporting the livestock sector has changed little in recent years, and many of the conclusions in the FAO Final Report of 2003<sup>20</sup> remain valid. There are indeed many dedicated and highly qualified staff doing their best to develop the sector, but progress has been marginal. Several factors that have tended to undermine effectiveness, including:

- **Budgets too low:** government revenues are constrained and overstaffing is prevalent. Most funding is spent on salaries, leaving little for programs and less for service delivery (not all plans can be realized);
- **Focus too broad:** too many activities are undertaken and not enough attention is paid to the core, high priority problem (breeding stock supply);
- **Under-pricing:** Providing low cost services deters the private sector from involvement (e.g., AI services); retail ceilings on milk prices discourage investment;
- **Role of the parastatals too large:** activities such as milk collection and processing and managing breeding farms are not necessarily tasks the government typically manages well. Doing jobs that could be left to the private sector diverts public resources from important assistance to farmers and consumers that the private sector typically cannot provide – regulation, enforcement, farmer and consumer protection, health and family welfare.

On the other hand, we see that some of the recommendations from the report were implemented. Importantly, institutes such as DAPH and NLDB are now setting targets and trying to achieve them. There is more attention being placed on economics and profitability of dairy farming and the role of the private sector in dairy development (stimulating the processing industry to invest more in milk collection through higher tariffs for milk powder and more market oriented price structures for raw milk).

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<sup>20</sup> Sri Lanka: Livestock Sector Development Action Plan, 2003.

## **2.6 Input Supply**

At the farm level, there are very few improvement options that producers can afford and are willing to invest in. Dairy farming is a typical low input low output system, especially in the more marginal areas of the Eastern Province.

In Sri Lanka, the demand and supply of farm inputs are still very limited, but with the development of the dairy sector, the demand for inputs can be expected to increase. This increase would include farm machinery for fodder production and conservation, milking and milk handling equipment, barn equipment, compound feeds, fertilizers, and chemicals. At present, there are identified constraints in obtaining seeds from improved varieties of grass and legumes, breeding stock does not meet actual demand, and simple grass and straw cutters are difficult to find.

It is possible to purchase a portable Italian-made milking trolley, but demand is still very limited. One interviewed dealer reported selling 60 trolleys over the past 5 years! Simple vacuum line milking systems are also available from the same supplier, although the level of support service and availability of spare parts is uncertain.

## 2.7 S.W.O.T. Analysis

A S.W.O.T. analysis of the dairy sector shows that there are currently many weaknesses and serious threats and only a few opportunities. There are a few, but important points mentioned under 'Strengths'. With the right policies, the sector can be gradually turned into a viable more competitive sector providing income to a large farming community.

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Large farming community</li> <li>• Natural resources available</li> <li>• End of civil war</li> <li>• Tariff on imported milk powder encourages local dairy development</li> <li>• Farmer willingness to modernize</li> <li>• Growing interest from milk processing companies, especially in Eastern Province, as a result of end of war.</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Low productivity of animals</li> <li>• Low or marginal profitability</li> <li>• Lack of feed, water and grazing lands</li> <li>• Small scale of farming</li> <li>• Poor infrastructure for marketing</li> <li>• Inadequate support services</li> <li>• Lack of investments</li> <li>• Lack of confidence in farming community</li> <li>• Poor outreach of veterinary services</li> <li>• Producer does not always receive correct price for his milk.</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• More attractive prices for raw milk</li> <li>• Support programs initiated by government, private sector and NGOs,</li> <li>• Agro-byproducts underutilized,</li> <li>• Fresh milk market developing</li> <li>• Employment opportunities for women and youth,</li> <li>• Integration with crop production.</li> <li>• New opportunities for support services</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Inconsistent government policy (e.g., price minimums paid to farmers, but also price controls on retail sales of powdered milk )</li> <li>• Competition from powder imports (loss of tariff protection advantage)</li> <li>• Opening of new agricultural lands for crop production</li> <li>• Possible ban on slaughter of animals.</li> </ul>

The dairy sector is an important source of regular income for the rural community. Family labor that would otherwise be under-utilized can now be effectively used. With a consistent and supportive government policy, the private sector will become the engine that develops the dairy sector.

## 3 Recommendations for Dairy Development

### 3.1 Policy Issues

The FAO 2003 report<sup>21</sup> gave a detailed review of the key issues that needed to be addressed for dairy development to succeed in Sri Lanka. Many of the recommendation in that report are still valid today, and especially important given recent changes that are expected to give a new impulse to dairy development. That list below combines the still valid conclusions from the 2003 report with updated findings and conclusions from the current situation. Dairy development in Sri Lanka must begin by taking into account the following:

- The livestock sector is predominantly smallholder based -- difficult and expensive to service;
- Milk yields and production are very low compared to major livestock producing and exporting countries;
- Improved nutrition, combined with genetic upgrading can be expected to show quick results;
- No original research is needed, but proven, risk-minimizing extension advice needs to reach more farmers on a steady basis;
- Government involvement in the sector is high (extension, veterinary services, breeding and milk processing). More involvement of the private sector is needed;
- Budget restrictions limit the actual support the Government can provide to the sector;
- Milk prices have risen and the potential for profitability in the dairy sector has improved, but it is still marginal and does not allow for expensive investments and technologies;
- Milk powder imports still dominate the market, but the recent tariff increase to LKR125 per kg of powder gives local milk producers the margin needed to develop – provided the policy is maintained;
- Sri Lankan consumers are not high volume consumers of milk. They consume more powdered milk than fresh. They are used to imported brands and products, and changing habits will take time; and
- The development strategy is focused mainly on replacing imports, rather than developing an export market for dairy products. This could be short-sighted with respect to nearby markets such as the Maldives.

The ‘National Policy on Agriculture and Livestock’ provides a very clear statement of the Government’s objective to move towards increasing sufficiency, with an aim to produce 50% of what is consumed in Sri Lanka by 2015. However earlier approaches towards self-sufficiency have not worked well -- suggesting that a change in the approach is needed.

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<sup>21</sup> Sri Lanka: Livestock Sector Development Action Plan, Food and Agriculture Organization (FAO) United Nations, 2003.

It is possible to combine a development policy that uses a protective tariff with many of the aspects of a market-led approach, and such an approach has more chance of leading to a sustainable increase in production and improved performance of the dairy industry. However, such a policy should be consistent to give strong signals to the private sector investors. Key features of this approach are to:

- Focus the domestic dairy industry on supplying high value and high quality fresh products to the growing number of middle income and wealthy consumers;
- Use the temporary protection of the higher tariff on imported milk powder (LKR125 per kg) to stimulate and improve the efficiency of milk collection, processing and marketing. The tariff permits payments of higher farm-gate prices to farmers to create an environment for incentive and reward for quality as well as productivity improvements. sector;
- The government can also use some of the revenues from the tariff to fund programs to improve the productivity of the sector,
- Intensify the efforts to improve farm level productivity through adoption of simple low-cost breeding, feeding and husbandry techniques, which with the higher milk prices will improve profitability; and
- Re-focus the livestock sector institutions to their core service delivery functions so that their limited resources can be deployed in the most effective manner.

### ***3.1.1 Institutional and Other Policy Issues***

This section discusses some of the institutional issues and challenges that the public and private sector face as they work together toward the goal of developing a competitive dairy sector. The Government of Sri Lanka introduced a special credit package for the dairy sector under the ALDL Scheme in April 2008. Under this scheme, LKR5.0 billion is to be disbursed by Participating Financial Institutions (PFIs) which include both private and state-owned banks. The scheme also addresses many constraints related to poor extension services, even offering incentive payments to LDIs for artificial inseminations. More such innovations that explore new service delivery systems and tap into private sector talents and energies are needed. Sri Lanka's own progress as a more developed economy has multiplied the variety of institutional and policy options available to the government – options that may be more effective and less costly than the array of institutions traditionally serving the dairy sector.

**NLDB:** Government should look for alternative models for providing farmers with livestock development and breeding services -- including leasing out some of National Livestock Development Board (NLDB) breeding farms to private sector operators on performance-based contract basis. NLDB is not detouring away from its primary mission of producing and distributing good breeding stock. Currently NLDB appears more interested in their entry into the business of processing and selling milk. A short article in the Daily News (August 24, 2009, p. 10) announced NLDB will soon implement plans to computerize data on the milking cows belonging to the Board. While this is worthwhile undertaking for any dairy operation, it seems

myopic for an enterprise whose mission is “Livestock to improve yields of dairy animals in the hands of private farmers rather than NLDB’s own 30 farms. As an initial step, the government could commission a report on the feasibility of privatizing a few NLDB. Alternatively, the government could outsource the work of breeding and distributing quality stock to private sector firms. This will enable the government to concentrate on the desired results – helping farmers to get better quality genetic

**AI and Breeding services:** As in the case of NLDB, Government should consider alternative means of service delivery such as using private sector providers under a performance based contract arrangement.

**Tariff Protection:** Government should have a plan in mind to reduce and end the tariff on imported milk powder. There are sound economic reasons to support a tariff that contributes to job creation and family incomes in an area where many families already own livestock that could produce a dairy income. The tariff can therefore contribute to peace and stability in the former war-ravaged areas. Over time however, livestock and dairy farming throughout Sri Lanka have to become increasingly productive and competitive. While tariff protection in this case is likely to stimulate productivity positively, it may not always do so in the future. When it ceases to do, the economic benefits generated by the tariff will cease to offset the high transfer “tax” being imposed on all milk powder consumers in Sri Lanka. Sri Lanka’s tariff does not and should not exceed its pledged or bound rate (50% ad valorem) made to the World Trade Organization (WTO). For the future however, a trading country like Sri Lanka, intent on making the most productive use of its scarce resources, should consider any tariff a self-imposed handicap to improving its economic well-being. Every tariff should have a "sunset" plan -- a date for its removal and a set of targets that government policy is aiming to achieve by means of the tariff. At the very least, progress toward improving productivity should be monitored carefully. Lack of progress indicates the tariff is not generating benefits that offset its costs. Positive progress should enable the government to gradually lower the tariff on the milk consuming population of Sri Lanka, thereby lowering its cost to the total economy.

During the time the tariff remains in place, the government should channel revenues earned from the tariff into efforts to make the protected sector more productive and more competitive with respect to global best practices and market prices.

**MILCO:** While MILCO is not contributing its full share to reducing the government’s fiscal problems, it is not today a major impediment to developing the dairy sector. Despite its inefficiencies, MILCO is for the time being the largest collector of milk in the country and is investing in new collection centers and routes in the East and North Central provinces. Insuring that MILCO has to compete with private sector processors on a “level playing field” increases choice and competition for dairy farmers and makes MILCO’s performance the arbiter of its future destiny. MILCO’s future will depend on how well it competes with private sector processors in collecting milk from dairy farmers and processing it for market. Supporting programs to allow villages to have and own a milk storage and cooling tank close to the village

gives farmers more options of choosing their buyer. This is good for farmers, and will likely be a better way of determining MILCO future than a policy of privatization on principle.

**Paddy vs. Dairy:** Senior policy makers in the government need to re-examine and consider restructuring incentives given to rice paddy farming. Government of Sri Lanka's policies encouraging and subsidizing rice production throughout the country should be reconsidered in light of the fact that they put dairy farming at a disadvantage in trying to compete for land and water resources. More consideration should be given to integrated farming systems. Subsidies for fertilizer and paddy have the undesired effect of discouraging other types of rural agricultural activity that might be more remunerative except for the government subsidies. This is especially true in the East and North where water is scarce, because paddy farming places major demands on local water resources. Currently the fertilizer subsidy policy also works as a partial disincentive for choosing to keep livestock and use manure as fertilizer.

**Culling:** Dairy sector and other policy analysts also have to exercise care and caution about policies that take culling decisions out of the hands of dairy farmers or put the government officials in charge of judging and enforcing decisions about animal slaughter. If dairy farmers lose their ability to make basic decisions about herd size, productivity, and animal sales, all other government policies and investments and all private sector investments aimed at building a sustainable dairy and livestock sector in Sri Lanka will not have a chance to succeed.

## **3.2 Technical Issues**

Targeted strategies, incentives, training, and policy can significantly impact dairy development. A list of technical recommendations for improving milk production, marketing, processing and distribution are given below.

### **3.2.1 Milk Production**

Technical recommendations to improve milk production include:

- Identify the target areas for dairy development and concentrate resources in those places;
- Concentrate dairy development efforts in districts with a high milk density;
- Take specific measures to support medium-scale commercial dairy farmers;
- Make state land available for use by livestock farmers;
- Encourage the use of improved breeds for milk production only in those areas where nutrition and management are adequate;
- Continue the development of so-called Dairy Villages, but ensure that the investments made by farmers lead to higher incomes from milk production;
- Consider incentive schemes and financial support for using improved livestock feeds and making on-farm investments that improve dairy production. If they are "time-bound" even

short term subsidy schemes can stimulate experimentation needed before adopting new behavior;

- Provide farmer training programs on nutrition and fodder management and stimulate the production of better quality fodders;

**Picture 5: Fodder production is essential to increase yields in a cost-effective way**



Source: USAID/CORE

- Stimulate the supply of basic farm inputs (fodder harvesting and cutting equipment, small milking units, cow handling tools);
- Register, supervise and audit the activities of private milk collectors and AI technicians;
- Improve and intensify the present AI and natural breeding services through training, monitoring and data collection;
- Design low-cost housing systems that meet the requirements for animal welfare and allow for an efficient and hygienic system of milk production;
- Facilitate the imports of improved seeds, genetic material and other essential inputs for growing the feed that dairy development will require,
- Identify the opportunities of making better use of agricultural by-products (e.g., rice straw, cane tops, molasses) and assist with the calculation of least-cost rations; and
- Explore expanded use of bio-gas as a by-product of dairying.

### **3.2.2 Milk Marketing, Processing and Distribution**

Farmers will invest in upgrading their milk quality and increasing the supply if they have a reliable way of selling the milk for an attractive price. The following recommendations are policies that will enable farmers to sell their milk and at the same time improve the raw milk quality.

- Move towards a policy of non-intervention in markets and pricing of animal products. Instead concentrate on insuring that markets are indeed competitive;

- End price ceilings on retail sales of powdered milk;
- Upgrade the present systems for milk collection by establishing small chilling centers at village level where milk supply justifies the investment;
- Continue the support to Farmer Management Societies as managers of the milk collection centers and collection points;
- Gradually introduce a milk payment system which is based on biological quality;
- Where justified start milk collection twice a-day to stimulate production increases;
- Provide training in basic milk handling and hygiene to all stakeholders in the supply chain;
- Assist dairy cooperatives, farmer milk societies and private dairy companies to upgrade their milk collection systems to improve quality and reduce costs;
- Stimulate demand for fresh dairy products by school milk programs in selected low-income areas, developing the distribution network and continued advertising campaigns;
- Prepare for high-end milk product sales to the tourism sector as that revives and grows in Sri Lanka; and
- Encourage exploration of export opportunities to nearby markets, such as the Maldives. Until 2006, Sri Lanka's milk product exports were less than 550MT per year, but in 2007, exports increased to 1,271MT per year. A large portion of this increase was due to the growth in exports of ice cream to tourist resorts in the Maldives.

**Picture 6: A small milk collection point in Eastern Province. The time between milking and chilling should be less than 2-3 hours, which is difficult to achieve**



Source: USAID/CORE

### 3.3 Overarching Conclusions

One conclusion and recommendation evident from this report is the case for an integrated approach to achieving the final objective of a viable value chain for dairy and livestock. Importance of an integrated dairy development program;

- Without markets farmers will not be interested in investing in increased milk production;

- Without genetic improvement, the milk yield potential of local cows will be too low to justify investments in better feeding and housing;
- Without improved nutrition the potential for milk production will not be realised and the quantities of surplus milk produced for sale will be too small to justify investments in milk collection;
- Without reliable veterinary services, the risk of disease and loss of expensive animals will be too high to for extra milk sales income to compensate;
- Without a cold chain, an efficient milk collection and a transparent payment system, the quality of marketed milk will not reach the required standards. Farmers will bear losses from spoilage and lost demand, because consumers will not be satisfied with the product;
- Without proper processing, safe food quality standards, packaging and branding the competition with other suppliers of dairy products and fresh milk will be very difficult and commercial viability of the system will be threatened; and
- Without a sufficient market demand and workable strategy for winning market share, milk sales will be lower than anticipated, short-changing farmers, processors and all stakeholders in the value chain of the deserved rewards and the funds needed to continue applying modern methods and best practices.

Dairy development will have to start in those areas where the infrastructure (cow density, road access and electricity supply) make it possible to build up a cost-effective milk collection system and where the potential to produce enough feed and fodder allows for crossbreeding programs and thus higher yields per cow. Despite expressed interest by processors in the general opportunity of establishing collection centres and routes in the East and North Central Provinces, serious research into specific routes and production areas has not been done.

Dairy development goes well beyond short-term project considerations and should be based on a long-term vision and commitments to provide the necessary support until a sustainable system has been developed. Dairy development requires substantial investments, not only in processing and milk collection facilities, but also in dairy farming (e.g., housing improvement, more and better cows, and fodder production). New investments, even new practices typically place some additional burden and risk on the farmer, and they only “pay off” if the farmer’s milk can be sold at a profit. Providing sufficient assurances that the milk can be sold at an attractive price is therefore essential to gaining and sustaining farmers’ interest in dairy development programs.

Several private sector companies are making investments in dairy development and processing facilities in the East. These investments offer significant additional market potential for milk in the region and help maintain attractive prices. The companies also see the need for investing in improving farming practices in the region. This is an opportunity for farmers to make investments in dairy farming.

## 4 Development in the Eastern, Uva and North Central Provinces

### 4.1 Introduction

The end of the war has opened the way to many development opportunities in the Eastern and North Central Provinces. While dairy development is one such opportunity, and a very important one, it would be a mistake to underestimate the challenges it faces. There are large herds of animals in the East with very limited genetic potential for milk production in its current state. They are often undernourished and kept in extensive production systems. Seasonal variation in milk production is large. Other problems include scarce and dwindling grazing lands, lack of drinking water, endemic diseases, low veterinary coverage and poorly developed milk collection networks. Government-owned milk processor MILCO and several private processors planning to create and expand milk collection in the North Central and Eastern Provinces offer significant potential for dairy development in the target region.

During the initial period of dairy development, milk that is potentially available, but not tapped can be collected through the creation and establishment of a milk collection system and related services. The next step in development will be a gradual increase in yield per cow, which can only be achieved if the milk price allows farmers to reduce herd numbers and intensify their production system. This needs a long-term approach and consistent dairy policy. Social and cultural practices, as well as environmental conditions should also be taken into account when introducing new approaches to change the present systems.

### 4.2 Milk Production and Support Services in Eastern and North Central Provinces

According to *Livestock Statistics* for 2007 only 7,689MT of milk were collected in the Eastern Province by the formal dairy processing industry, leaving a theoretical surplus of 17,871MT per year or 49MT per day. One must assume, however, that the informal market already processes part of this surplus and as statistical data are only indicative, there is much room for error<sup>22</sup>. In the NCP most of the milk that is being produced is also collected (22,071MT/year is collected, leaving a surplus of 3,489MT, less than 10MT/day).

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<sup>22</sup> During the war, the collection of data in the North and Eastern Provinces was extremely difficult.

**Table 4.1: Milk Production and Cattle/Buffalo Population in the North Central Province and Eastern Province - 2007**

Districts in EP	Total Cattle	Annual Milk Production (MT)	Total Buffalo	Annual Milk Production (MT)	Total Milk Production
Ampara	70,600	3,791	10,700	1,807	5,598
Batticaloa	67,540	9,126	19,500	2,059	11,185
Trincomalee	48,770	4,687	11,250	1,667	6,354
<b>Totals EP</b>	<b>186,910</b>	<b>17,604</b>	<b>41,450</b>	<b>5,533</b>	<b>23,137</b>
<i>Other Districts</i>					
Jaffna	53,000	8,122	0	0	8,122
Kilinochichi	36,000	3,643	1176	68	3,712
Mannar	24,900	2,812	2084	122	2,934
Mullaithivu	36,680	3,524	4100	446	3,971
Vavuniya	27,900	2,977	1684	72	3,049

Districts in NCP	Total Cattle	Annual Milk Production (MT)	Total Buffalo	Annual Milk Production (MT)	Total Milk Production (MT/Yr)
Anuradhapura	151,980	15,599	35,800	3,845	19,444
Polonnawura	42,070	5,328	16,000	788	6,116
<b>Totals NCP</b>	<b>194,050</b>	<b>20,927</b>	<b>51,800</b>	<b>4,633</b>	<b>25,560</b>

Source: Livestock Statistics 2007

As present raw milk, supply is highly seasonal, monthly and daily average figures have to be handled with care. In one of the dairy villages, the chairman of the FMS informed us that during the peak season, his village could sell 1,000 liters per day, but during the off-season, this was reduced to only 50 L/day. Because transport costs to collect 1,000 liters or 50 liters are almost the same, milk collection in the off-season becomes a very expensive, possibly altogether unprofitable exercise.

The present approach to develop so-called “Dairy Villages” is based on the Indian experience, which has been very successful. In India, the cooperative system goes beyond village level organizations. There farmers also formally own the processing plant and thus control the total chain from cow to consumer. This model was developed shortly after the Second World War (the AMUL Cooperative in Gujarat state was founded in December 1946).

In Western Europe, cooperatives had already been established towards the end of the nineteenth century. In most places, they started on a village level, gradually expanding and growing to meet the challenges of competition by increasing the scale of operation. Not only did the milk processing industry develop in this way, but similar processes can be seen in breeding organizations, insurance companies, banking systems, feed producers and many other

agricultural enterprises. As a pattern, the development always started from the bottom locally and developed gradually.

In Sri Lanka, the concept of dairy villages is more or less limited to organizing farmers in FMS that manage their own milk collection centers and help them to develop milk production and marketing. This will make dairy a more profitable business for the members and makes it easier to target and develop the necessary support services.

The Government has allocated an amount of LKR22, 500 per individual farm for investments in cattle sheds, bio-gas units, milk cans, water pumps, small water tanks and other utensils. Farmers are to pay 50% of the investment costs themselves. Through model farms, the Government hopes to promote innovations in dairy farm management.

In 2007, 60 such villages were established in the Eastern Province (in Ampara, Batticaloa and Trincomalee Districts) by DAPH in close cooperation with MILCO. In 2008 another 8 villages were added in the same districts. At the time of this report writing, no budget had been made available for further implementation of this *Dairy Village Development* program in 2009. Data on Dairy Villages in the NCP could not be obtained during the mission, but it is likely that similar developments have taken place.

**Picture 7: Meeting with members of a FMA supplying milk to MILCO in the Eastern Province**



Source: USAID/CORE

Several farmers in dairy villages were visited, but in order to obtain a good understanding of the achievements and remaining constraints, a full assessment should be carried out. Before major new investments are made in the sector, a new baseline study is required. Basic questions that need reliable data and answers are:

- Changes in milk supply per farmer and per cow;
- Changes in milk quality and its effect on milk prices;
- Calving intervals and number of inseminations per pregnancy;

- Fodder production and yields per year;
- Feed intake and use of compound feeds;
- Health status and incidence of diseases;
- Working conditions and animal welfare in improved cow sheds; and
- Economic and financial returns from dairy farming.

The outcome of such a survey should then be used to adjust the dairy village approach. Since most milk processing companies are now following a similar approach, the results should be presented and discussed during the workshop involving all stakeholders.

### **4.3 Milk Processing and Marketing**

The available data show an increased demand for milk and dairy products, mainly as a result of rising standards of living and an increase in the urban population. The effect of this growing demand has been an increase in the imports of dairy products rather than substantial growth of the local production. Promoting a liquid milk market through a large national awareness campaign is badly needed.

With the present import tariff on milk powder raised to LKR125 per kg in 2008 and to LKR145 in 2009, and the higher prices being paid for raw milk, it is at least financially possible to invest in the development of the local dairy industry, perhaps not at the rate as expected by the Government, but with a consistent policy a gradual increase in yields and total production is achievable. Developers should keep in mind that investors and farmers have only recently seen the higher prices on milk and may not be entirely convinced the better margins will be there reliably. Recent moves by the government to lower the “gazetted” ceiling price on powdered milk have aggravated those suspicions. Inconsistent policies will undermine investment and development initiatives – by both the public and private sector.

As this report is being drafted, milk-processing companies are showing great interest in the Eastern Province as a potential source of raw milk, which is very encouraging. At present there are at least three companies establishing new dairy processing plants or on the verge to start construction. The total additional capacity is to reach about 100MT per day within the next few years. That would be as much as the total quantity of milk, which is registered as ‘not collected’. Producing such a large quantity will however require proper planning, infrastructure, and equipment.

The three main existing dairy companies are also expanding their milk collection in the Eastern Province, there most likely will be a healthy competition for raw milk that should benefit the producers. On the other hand, there is a risk that processing companies could be discouraged from investing too much in on-farm development, fearing they could easily lose their suppliers (and investments) to a competitor. One way to establish long-term relations with dairy farmer/suppliers is to assist them with obtaining loans or credit that can be repaid through milk

revenues. This system is already practiced by many of the middlemen working in these areas and proves to be very effective.

#### **4.4. Other Policy Issues**

With some exceptions, the policy issues facing dairy development in the East and North Central Provinces are the same as those discussed in Chapter 3 for the entire dairy sector. One exception is the issue of security and checking of lorries. It will be important for dairy development, that Government security officials work with milk processors to develop measures that will meet and satisfy government security concerns, with minimum transport interruptions. Seals and stamps for already screen lorries, “green channels” for dairy company lorries that have instituted their own security checks with government approvals and other measures will expedite transport without sacrificing security.

## 5. Recommendations for Dairy Development in the Eastern, Uva, and North Central Provinces

The dairy sector has deep roots in the Eastern, Uva, and North Central Provinces. In addition, the end of hostilities has opened the way for new investment and development. The higher tariff on imported milk powder has also helped spark a wave of investment in new milk collection centres in these areas. Dairy development is a strong tool in supporting rural development: it provides regular income; work (for both men and women); helps integrate farming systems; provides important by-products such as beef, hides and manure for heating and fertilizers; and makes use of agricultural waste- and by-products such as straw, stover, natural grasses, bran and cakes. In all the areas that were visited; farmers were very eager to become involved in dairy development. Several private sector companies have commenced investment in dairy development in the region. Also from the government's side at the national, provincial and district level, the reactions were very encouraging.

Although earlier efforts failed to develop a platform in which all stakeholders of the dairy industry participate, there is a need for rational cooperation and planning among the dairy companies. A united dairy sector would also be a serious partner for the government and thus could influence policymaking. Lack of coordination could lead to over-investing (e.g., duplication of collection centres) in prime areas and under-serving or ignoring other areas with a lower, but viable potential. USAID/CORE could be the facilitator and coordinator of such a platform.

In most parts of the Eastern Province (but to a large extent also in the neighbouring provinces) dairy development will have to start with the establishment of the basic organizational infrastructure: bringing the farmers together, organising the first milk collection centres, providing support in all aspects of dairy farming and quality management, establishing the processing facilities and developing the local market for dairy products. This requires a longer-term commitment of the processing industry, a consistent and supportive government policy and targeted inputs of donor organisations. Practically speaking building the processing plant is the easiest part of the dairy value chain. Making sure that enough milk of acceptable quality is collected daily and that all dairy products are sold at a price, which supports the further development of the dairy sector, is more complicated to achieve.

The private sector, government agencies, and donor projects can use its resources to help ensure that ongoing or new initiatives do not fail because the support packages are insufficient or not based on proven messages.

**The following short-term initiatives or programs are recommended:**

- Baseline surveys on best locations for dairy development in the North Central and Eastern Provinces;
- Impact evaluation of the Dairy Villages program;
- Assess the quality and performance efficiency of AI services; and advocate for more private sector participation using performance based outsourcing contracts; and
- Technical advice on dairy plant design and evaluation of offers.

**Medium-term (project duration) investments and programs that are needed include:**

- Sponsor and support a dairy farmer training through use of broadcast media (radio/TV) and interactive workshops, as well as internet or CD based training where possible. Also, include market information about animals, AI services, animal feed, and animal manure for sale. Development agencies could partner with a private sector milk processor or a supplier of cattle feed to sponsor an extension program broadcast over the appropriate media (most likely radio). The broadcasts would contain extension service information useful to dairy farmers in the local language. Development agencies can play a catalytic sponsorship role in helping such a program to be created and launched. However, the broadcasts could be sustained commercially by their popularity and paid commercials. Radio programs that broadcast helpful information about best practices, new collection centers, reliable providers of breeding services, recent market prices and other information have devoted followings in most rural communities, especially those that foster listener participation and feature local success stories.
- Train better trainers (government extension services) on all aspects of dairy farm management, (private processors such as Nestle use some of their own trainers, but in cooperation with government extension services).
- Provide guidance and support for targeted model or “demonstration” “Dairy Village farmers, such as the Pelawatte Sugar company program.
- Encourage innovations on housing of dairy cows (simple free-housing systems). Build demonstrational pilots, distribute photographs and diagrams. The Amul model is being followed too lavishly. For example, dairy farmers do not realize they could use straw or sand bedding instead of concrete floors in their shelters.
- Support the expansion and quality of AI services and stud bull distribution. Development agencies could provide training to AI providers and possibly offer a pilot system of incentive payments to farmers (not to the government) for a successful calf birth. Given the current cost of LKR300 per AI trial, an incentive payment even as low as another LKR300 per successful birth should have the desired effect. The program would be time bound. Training for the AI technicians would be open to private and government providers. Calf births could be verified using local veterinarians making independent verifications by simply visiting participating farmers to see the calf.
- Support a “heifer and calf nutrition program” for female calves born under the AI program. The technician provided a special feed formula on a monthly basis (fed to the calf on daily basis) for 18 months following the birth. The technicians (government or private) will also provide with measurements of calf growth for monitoring purposes. Estimated cost of feed

per calf would be USD 125 to USD 150 per calf at the current cost of “concentrate feed”, LKR26 per kg.

- Assist the livestock industry with the establishment of better market information systems for the sale of animals, location of forage, surplus products, and manure. This is related to the first recommendation but recognizes the need to invest in an effort to develop information about supply and demand. For example a central database and market for surplus male animals would allow farmers in areas needing stud bulls to locate surplus animals in other areas – thereby generating income that would otherwise be lost if the surplus went to slaughter. Such a program could grow out of the detailed assessment recommended above.
- Support the development of milk collection centres at the village level (owned and managed by the village community), and tied into solid reliable buyers (dairy processing companies or curd vendors) rather than middlemen.

## Appendix A: Retail Prices of Liquid Milk and Milk Powder Products Colombo, July 2009

Brand	Product	Ingredients	Type	Package Type	Package Size in ml	Price in LKR	Cost per Liter or kg. LKR	Cost per Liter LME* LKR
Ambewela	Liquid Milk	Full Cream	UHT	Carton	1,000	125	125	125
Ambewela	Liquid Milk		UHT	Pouch	180	30	167	167
Rich Life	Liquid Milk	Full Cream	UHT	Carton	1,000	125	125	125
Rich Life	Liquid Milk	Low Fat	UHT	Carton	1,000	150	150	150
Rich Life	Liquid Milk	Full Fat	UHT	Carton	200	32	160	160
Rich Life	Liquid Milk		UHT	Pouch	200	32	160	160
Rich Life	Liquid Milk	Full Fat	Past.	Pouch	200	30	150	150
Anchor/Newdale	Liquid Milk	LF/FF	Past.	Bottle	1,000	120	120	120
Anchor/Newdale	Liquid Milk		UHT	Carton	450	65	144	144
Highland	Liquid Milk	Low Fat	Past	Bottle	450	85	189	189
Highland	Liquid Milk	Full Fat	Past	Bottle	459	80	174	174
Nestle	Liquid Milk		UHT	Pouch	180	34	189	189
Lakspray	Liquid Milk		UHT	Pouch	180	30	167	167
Average Price per liter for liquid Milk							<b>155</b>	<b>155</b>
Anchor/Newdale	Milk Powder	Full cream		Carton	400	260	650	97
Ratti	Milk Powder	Full cream		Carton	400	220	550	82
Maliban	Milk Powder	Full cream		Carton	400	215	538	80
Nestle	Milk Powder	Full cream		Carton	400	260	650	97
Highland	Milk Powder	Full cream		Carton	400	225	563	84
Lakspray	Milk Powder	Full cream		Carton	400	240	600	90
Milgro	Milk Powder	Full cream		Carton	400	220	550	82
Kotmale	Milk Powder	Full cream		Carton	400	220	550	82
Candy	Milk Powder	Full cream		Carton	400	209	523	78
Average Prices for Milk Powder per Kilogram and per Liter LME							<b>575</b>	<b>86</b>

Notes: LF=low fat. FF= full fat.

\* LME= Liquid Milk Equivalent 1 Kg. of milk powder =7.7

## Appendix B: List of Reports and Papers

- Survey on Cost of Production of Milk, Livestock Statistical Bulletin, DAPH, Volume 1, Issue 1, 2008
- Breedable Cow Population and It's Contribution to the Formal Milk Market in Sri Lanka, Livestock Statistical Bulletin, DAPH, Volume 12 Issue 1, 2009
- Cost of Production of Milk under Different Management Systems, H. Kathalawala, DAPH March 2009
- Dairy Industry Statistics, DAPH, February 2008
- Annual Report 2008, DAPH
- Livestock Farms Registration in Central Province 2007, DAPH
- Sri Lanka: Livestock Sector Development Action Plan, Government of Sri Lanka/FAO,2003
- Sri Lanka Livestock Statistics 2007, Ministry of Livestock Development, August 2008
- Livestock in Rural Development, Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP), Action Research Experiences in Asia, November 1996
- Constraints and Opportunities for Increasing the Productivity of Cattle in Small Crop-Livestock Systems, DAPH/ICE, Workshop Proceedings November 1994
- The National Breeding Policy Guidelines for Livestock in Sri Lanka, Ministry of Agriculture, Lands and Forestry Sri Lanka, October 1994
- National Livestock Development Policy and Strategies, Ministry of Livestock and Infrastructure Development, Sri Lanka, September 2006
- An Assessment of Dairy Industry Policy in Sri Lanka, John H. Eriksen, AgEnt project, March 1998
- Characteristics of Cattle Farming Systems in Sri Lanka, H. Abaygunawardena et al., January 1997
- Sri Lanka Livestock Statistics 2002, Ministry of Agriculture and Livestock, Sri Lanka, December 2003
- Peoples Bank Economic Review, Milk - Emerging Issues of the Industry, Sept/October 1996
- Sri Lanka Opportunities for Dairy Sector Growth, N.F.C. Ranaweera

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