Global Dairy Markets: Implications for Sri Lanka

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Introduction

Sri Lanka is becoming increasingly dependent on the global dairy market to fulfill its growing needs for dairy products. According to the Food and Agriculture Organisation (FAO), per capita daily supply of milk and milk products from import sources increased from 32.67 g in 1990 to 81g in 2005. Thus, the dependency on imports has risen from 45% to 77% during the same period. Consequently, Sri Lanka has been increasingly affected by the fluctuations in the global dairy market. Unprecedented changes in the global dairy market have been observed at the time of writing this article. In particular, global dairy product prices rose four-fold from 2002 to 2007 and many experts expect that dairy prices will continue to rise.

The purpose of this paper is to describe the recent changes in the global dairy market and to examine their likely impacts on the Sri Lankan dairy market. The paper is organised into five sections. The second section outlines recent patterns in global dairy production, consumption, stocks and trade, and the domestic and trade policy regime of major exporters and importers. The third section provides an account of the factors that contributed to the recent price hike. The dairy trade patterns of Sri Lanka are presented in the fourth section. The final section outlines possible implications of global market changes on the Sri Lankan dairy economy.

2. Global Dairy Market Trends

2.1 Production, consumption, trade and stocks

The global dairy market has some unique characteristics. Milk production of the five leading trading countries, viz., the European Union (EU), United States, Australia, New Zealand and Argentina, account for only 40% of the world's milk but contribute to over 80% of global exports (FAO, 2007). Hence, the biggest exporters in the international dairy trade, viz., New Zealand, Australia and the EU are not necessarily the largest producers. New Zealand, for example, is a comparatively small producer, but a major exporting country. The annual growth rates of milk production in the developed countries and developing countries were 0.3% and 4.0%, respectively, during 2004-2006 (FAO, 2007). Annual per capita consumption of dairy products in developed countries and developing countries was 204.42 kg and 49.29 kg, respectively, in 2003 (FAO, 2008), suggesting that developing countries consume much lower quantities of dairy products compared to developed countries. During the last decade, the rapid economic growth experienced in many developing countries has generated a greater demand for higher-value foods, such as dairy products. Per capita consumption of milk and milk products had increased by 20%, 20%, 30% and 300% in India, Brazil, Nigeria and China, respectively, from 1990 to 2005 (FAO, 2007).

Internationally traded major dairy products include, butter, cheese, skim milk powder (SMP) and whole milk powder (WMP). Production of SMP and WMP constitute a small fraction of the market, which mainly cater to the developing world (Figure 1). Cheese production has remained stable as a percentage of the total production of dairy products. According to the Organisation for Economic Co-operation and Development (OECD) (2008), consumption of skim milk powder has declined by 6.7% over the past decade, while that of butter, cheese and whole milk powder has increased at an average rate of 24.35%, 18.68%, and 42.6%, respectively.

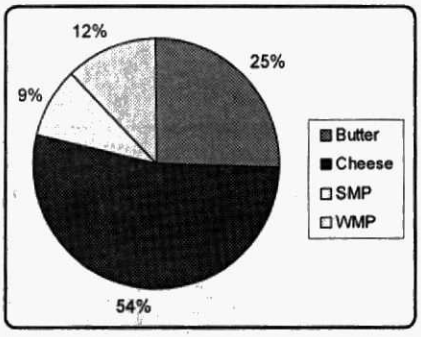

Figure 1: Global dairy production in 2007. Source: OECD, 2008.

The major exporters of dairy products are the EU, New Zealand and Australia; the EU dominates the global dairy market in 2007 (Table 1). The principal suppliers of cheese and dry milk products to Asian markets are the low cost producers in Australia and New Zealand, while the subsidised EU producers focus on nearby markets in Africa, Middle East and Russia, and export significant amounts of cheese to North America.

Table 1
World's largest exporters and importers, 2007

Exporting Country	Exports	
	Total exports ('000 US$)	%
World	44,978,320	100
EU	32,482,586	72.22
New Zealand	4,746,644	10.55
Australia	1,963,110	4.36
USA	1,545,098	3.43
Belarus	722,273	1.60

Importing Country	Imports	
	Total imports ('000 US$)	%
World	44,407,050	100
EU	23,924,058	53.87
USA	1,728,175	3.89
Mexico	1,030,117	2.32
Japan	1,023,205	2.30
Russia	918,455	2.07

Source: Market Access Map, 2008.

The top importers of dairy products in the world, the EU, United States and Mexico, account for 60% of the global imports in 2007 (Table 1). The remaining import market is mainly accounted for by Asia. Table 2 shows the import quantities of specific dairy products in developed and developing countries. It is evident that the developed countries import more butter and cheese in comparison to developing countries, while developing countries import much higher amounts of dry milk powders compared to developed countries. These values for developed countries have been decreasing, while they are increasing for developing countries over time.

Table 2
Import quantity of dairy products by country category (1000 MT), 2006

Country category	Butter	Cheese	SMP	WMP
Developed	707.77 (62.20)	869.79 (59.62)	99.08 (8.28)	57.49 (3.63)
Developing	430.16 (37.80)	589.18 (40.38)	1097.12 (91.72)	1524.76 (96.37)

Percentage contribution to total global imports is provided within parentheses.
Source: OEDC, 2008.

Australia, New Zealand and the EU-15 remained the world's largest exporters, supplying 86.3% of total butter exports in 2005. Meanwhile, Russia accounted for approximately 25% of the total global butter imports (FAPRI, 2005). Driven by growing demand and strong prices, India's butter production has been increasing tremendously to fulfill requirements domestically.

The EU-27, United States, Australia and New Zealand are the major cheese producers. The EU-27 is the largest producer and exporter of cheese. Their consumption levels are also much higher. Though the United States is the second largest producer of cheese, it is also the second largest importer and most of the U.S. cheese requirement is met through imports from the EU (OECD, 2008). This is a result of the contemporary trend towards specialty products. Thus, faced with the higher returns associated with cheese production, the EU has inclined to channel most of its milk into cheese production at the expense of butter and dry milk powder production. New Zealand and Australia are the other major exporters of cheese.

The EU-27, United States, New Zealand and Australia are the major producers and exporters of SMP, capturing 73.3% of the SMP market in 2005 (Food and Agricultural Policy Research Institute (FAPRI), 2005). The consumption levels of SMP are much higher in Japan and other Asian countries. Though China is one of the largest producers of WMP, it consumes almost all of its production domestically. New Zealand is the biggest exporter of WMP, though it is the third largest producer of WMP (OECD, 2008).

Stocks of dairy products are maintained mainly by the EU-27, United States, New Zealand, Canada and Brazil. However, the stocks have been decreasing over time in all these countries. Though the EU and United States had maintained large milk product stocks, they too have declined since 2002. According to Figure 2, the stock change annually has fluctuated over time. The change has become negative for most of the dairy products considered since 2003. Stock of SMP, though increasing until 2002 annually, has started declining at an increasing rate first and at a decreasing rate during the recent past. Similarly, the stocks of dairy products have seen an increase since 2005.

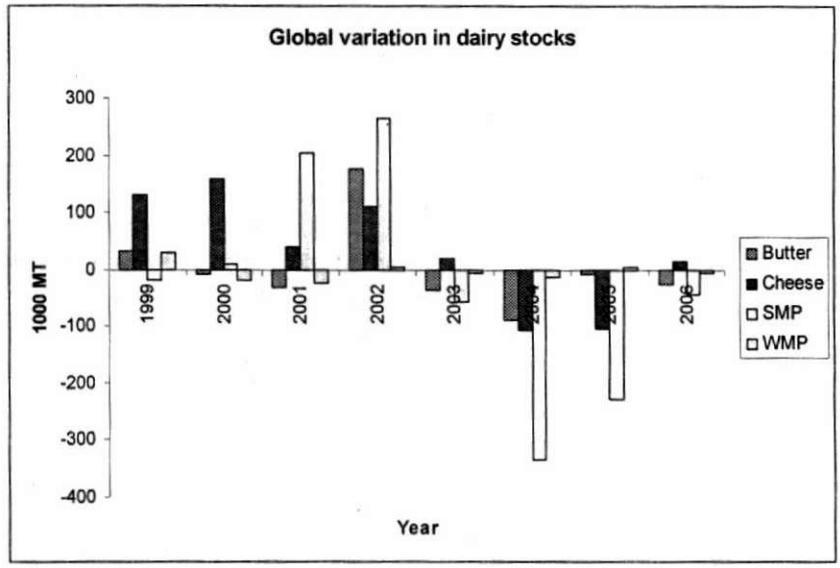

Figure 2: Global variation in dairy stocks (1999-2006)
Source: OECD, 2008.

2.2 Global dairy policy environment

The world dairy market is considered to be highly distorted due to the presence of various protection measures such as tariffs and tariff-rate quotas, export subsidies and domestic support mechanisms. The measures used vary from country to country. For example, the EU provides significant protection on butter and cheese using export subsidies while the Japanese dairy market is protected through high tariffs on imports of milk powder and cheese. Milk production and marketing quotas are maintained by most of the OECD countries to control the growth of surplus production and budgetary expenditure on domestic support mechanisms, while improving the political sustainability of high price support. Furthermore, milk-producing countries are highly protected through price support mechanisms either by domestic discriminatory pricing support or by support through trade measures, compared to other sub-sectors of agriculture (OECD, 2008). The Uruguay Round Agreement in Agriculture URAA, which was replaced by the World Trade Organisation (WTO), reduced some of the market distortions in the dairy sector through the creation of minimum access commitments, the banning of new export subsidies and the reduction of domestic support mechanisms. Since it became clear that the WTO is in need of some reformation, discussions were initiated in developing the Doha Development Agenda (DDA) in 2001. The DDA is an on-going discussion which seeks the gradual reduction of all the trade barriers and an eventual elimination of these barriers.

3. Dairy Price Movements and Factors Affecting Dairy Prices

Global dairy prices fluctuated between usual ranges before 2005, until they experienced a sudden spike after 2006. Monthly indices of international prices for selected dairy products, as depicted in Figure 3, clearly indicates the global changes that have occurred in prices during 1990-2008.

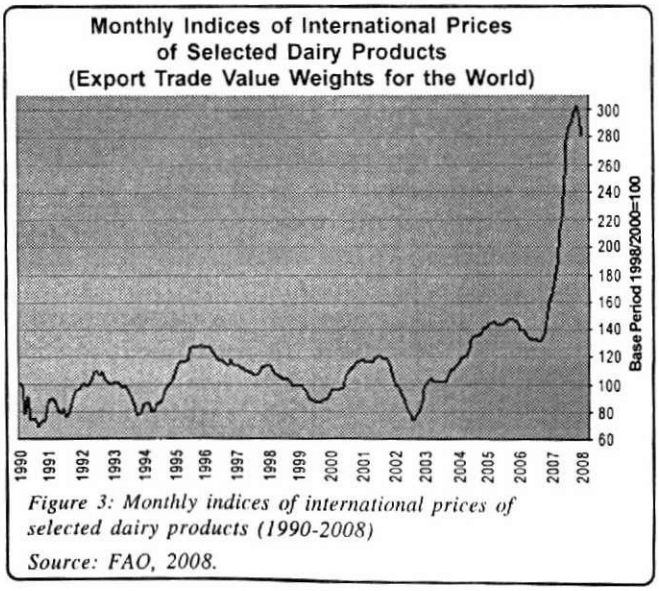

Figure 3: Monthly indices of international prices of selected dairy products (1990-2008)
Source: FAO, 2008.

The peculiar and unprecedented rise in the international dairy price was 130% in the late 2007 as compared to the prices in mid 2006 and 400% as compared to the prices that prevailed in 2002 (FAO, 2008). This spike in the global dairy prices have occurred due to a series of supply side and demand side shocks as well as policy changes. The following section presents the key factors that affected dairy prices in the recent past:

3.1 Supply side shocks

a. Climate change

Climatic change refers to any long-term significant change in the "average weather" that a given region experiences, which in turn interrupts agricultural activities seriously, leading to lower production levels. Some significant changes in milk production levels have been observed due to changes in climatic conditions in Australia, New Zealand, Argentina and Uruguay in the recent past. Poor weather conditions in New Zealand during 2005 led to flooding in major producing regimes which caused the production to fall for the first time since 1998/99 (Foreign Agricultural Service (FAS), 2005). In early 2007, droughts in Australia affected dairy production once again, and flooding in Argentina and Uruguay deteriorated pasture lands leading to feed scarcity and, consequently, lower milk production. In the third quarter of 2007, higher feed prices and poor pasture conditions due to dry weather reduced milk production in the EU (FAO, 2007). These factors resulted in a reduction in milk supply and a rise in milk prices.

b. The bio-fuel boom

Following the world energy shock, the demand for bio-fuel such as ethanol and bio-diesel increased tremendously. This trend has created a high demand for cereals, sugarcane and oil seed crops. Ethanol production more than doubled and the bio-diesel production quadrupled from 2000 to 2005 (Earth Policy Institute (EPI), 2006). Corn-based U.S. ethanol and sugarcane-based Brazilian ethanol account for 90% of the global ethanol production (U.S. Department of Energy, 2006). This resulted in a rise of feed prices in the U.S. and milk production was negatively affected. Also, grain production for bio-fuel has been undertaken at the expense of cattle farming in some areas (FAO, 2007). This had reduced the supply of dairy products and increased dairy prices. However, according to Bouet and Dimaranan (2008), the energy shock and bio-fuel subsidies implemented in the EU and U.S. during 2001-2007 could explain only 0.8% of the increase in world livestock prices.

c. Declining stocks

Dairy supply depends on the production and availability of stocks. The chronic slip in supply conditions started to aggravate with the emptying of the public intervention stocks of SMP in the EU, during the latter part of 2006 (FAO, 2007). Meanwhile, the stocks of dairy products have started declining drastically since 2002 in most of the major dairy-producing and trading countries (OECD, 2008). The declining stocks would further worsen the supply making it impossible to meet the demand in the long run.

3.2 Demand side changes

a. Rapid economic growth and population change

Along with the supply side shocks, the increasing global demand for dairy products also motivated the price spike observed in 2007. Rapid global economic growth in many parts of the developing world has increased the purchasing power of citizens. Developing Asia, especially China and India, continues to show strong economic growth. The economic growth rate has increased by 9% per annum during 2004-2006 in developing Asia (International Monetary Fund (IMF), 2007). This has led to an increase in the demand for dairy products. Meanwhile, diet globalisation too has contributed to the increased consumption of dairy products in Asia (Pingali, 2006).

b. Changing consumption patterns

Changing demand patterns of different dairy products have also contributed considerably to this price hike. The demand for cheese and WMP are increasing in the high-income, developed countries and the exporters are more inclined to produce these value-added products due to the higher returns they bring. Thus, the production of skim milk powder and butter, which are mainly used as raw materials for many dairy processing industries, is discouraged. The seeking of specialty products has driven North America to import majority of its cheese requirement from the EU, despite high prices. Also, the growing consumption of cheese in the EU has reduced the exportable supplies of other dairy commodities sharply. Since milk production in the EU is held by production quotas, the production of cheese is done at the expense of other dairy products (FAS, 2005).

3.3 Policy changes

Following the changes in the world dairy market, especially the price hike, countries started to adjust policies to face the crisis. India imposed an export ban on SMP in 2007 and Argentina imposed a prohibitive export tax that ultimately reduced the quantity traded (FAS, 2007). These policies reduced the supplies in the world market, further worsening the crisis.

The proposed DDA packages, if implemented, will further increase prices of dairy products. According to the simulations carried out using global trade models, with the elimination of all protectionist policies under the DDA, the average international milk price would sharply increase compared to the prevailing levels, having a significant impact on the global dairy market. Higher world prices after liberalisation of trade barriers would be a result of the decline in the production and trade volume of milk and milk products. This would occur primarily due to the elimination of export subsidies.

4. The Sri Lankan Dairy Market

4.1 Consumption, production and trade

The above-mentioned conditions in the global dairy market greatly influence the dairy markets in trade-dependent countries like Sri Lanka. The demand for dairy products in Sri Lanka is largely met through imports. In 2006, domestic milk production contributed to only 17% of the total dairy requirement while the rest was met through imports. Sri Lanka imported around 65,000 MT of dairy products in 2006 and the import bill on dairy products was approximately 15 billion rupees (Ministry of Livestock Development, 2007).

Figure 4 shows the changes in the production, consumption and trade volumes of dairy products in Sri Lanka from 1990 to 2005. It can be observed that production dropped drastically during 1998, though consumption has remained steady. Domestic producers have failed to expand their market share to meet the demand. Thus, the level of importation has increased more than twice during the last 15 years, implying Sri Lanka's growing dependency on imports.

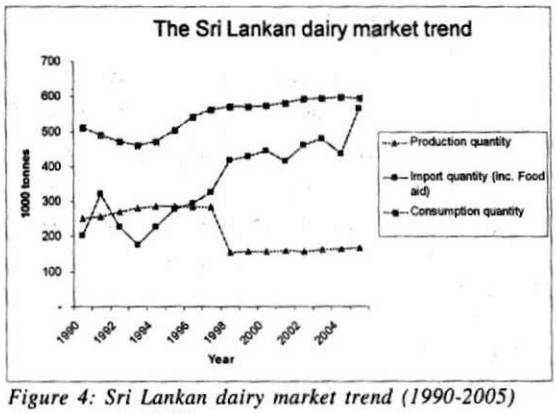

Figure 4: Sri Lankan dairy market trend (1990-2005)
Source: FAO, 2008.

Currently, dry milk powder is the form that is most consumed in Sri Lanka. The consumption of milk products has almost doubled and the consumption of fresh milk dropped drastically in 2003/04 compared to 1996/97 in the urban, rural and estate sectors (Figure 5), showing a clear switch from fresh milk to dry milk powder (Central Bank of Sri Lanka, 1999 and 2005).

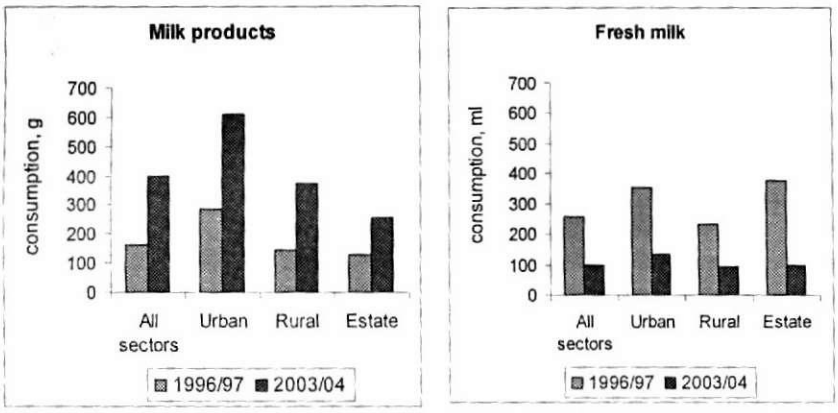

Figure 5: Per capita monthly consumption of milk products and fresh milk in Sri Lanka by sectors.
Source: Central Bank of Sri Lanka, 1999, 2005.

Sri Lanka's main sources of importation of dairy products are Australia and New Zealand which accounted for 94% of the total imports in 2007 (Market Access Map, 2008). The remainder is supplied mainly from the EU. The domestic prices of dairy products have always reflected world market prices, implying minimal insulation from the global dairy, market.

4.2 Sri Lankan dairy trade policy

The major barrier to dairy trade in Sri Lanka is the border tariff on the importation of dairy products. In compliance with commitments to the WTO, the import restriction for dairy products is now an *ad valorem tariff*, which is set as a percentage of the value of dairy products imported to Sri Lanka. Currently, the average bound tariff rate for agricultural products is 49.70%. Sri Lanka has so far consistently accomplished the WTO requirements in tariff reduction. The applied rates are already far below the bound rates where it is 28.34% for agricultural products on average. The Most Favored Nation (MFN) applied tariff rates for dairy products during 1998, 2001, 2003 and 2007 were 24.8, 19.0, 20.7, and 19.6 per cent, respectively (WTO, 2004 and Market Access Map, 2008). Also, dairy products as a whole have a lower tariff rate compared to the average tariff rate for agricultural commodities. The applied tariff rates for specific dairy commodities are shown in Table 3.

Table 3
Applied tariff rates in Sri Lanka for dairy products in 2007.

Selected product codes	Product description	Number of lines	Total estimated *ad valorem* equivalent tariff (%)
0401	Milk and cream, not concentrated nor containing added sugar or other sweetening matter	3	28.00
0402	Milk and cream, concentrated or containing added sugar or other sweetening matter	6	15.47
0403	Buttermilk, curdled milk and cream, yogurt, etc.	2	28.00
0404	Whey	2	9.26
0405	Butter and other fats and oils derived from milk; dairy spreads	3	28.00
0406	Cheese and curd	5	25.46

Source: Market Access Map, 2008.

The applied tariff rate for dry milk powder (15%) which is consumed in large quantities is lower than for other dairy products (28%). The government envisages further reductions of the tariff for dry milk powders to minimise the adverse effects to consumers due to the price hikes in the international market.

5. Likely Impacts of Global Changes on the Sri Lankan Dairy Market

It is clear from the above discussion that the Sri Lankan dairy market, which depends on the world market for nearly 80% of its dairy products requirements, will undergo drastic changes due to the changing world market conditions. Such changes will be highly dependent on the nature of mitigating policy measures implemented by the Sri Lankan government. For instance, the increase in world market prices, in the absence of domestic policy measures, will provide an opportunity for the domestic dairy producers to increase the quantity of milk production and profitability of dairy farming. Meanwhile, it will have adverse impacts on the milk consumers in Sri Lanka.

However, examination of effects of global price changes in the absence of policy measures is not a realistic scenario, since the Sri Lankan dairy policy environment has been changing simultaneously. The government policy on dairy development aimed at producing 50% of the country's requirement by 2015 (Ministry of Livestock Development, 2008). Thus, priority is given for dairy development and public sector investment programs, while several incentives are also provided for private sector producers to engage in dairy farming. Promoting a liquid milk market is identified as a precondition for increasing the competitiveness of the domestic milk industry in Sri Lanka. Programs have been undertaken to upgrade the native herd and support the participants in the value chain of dairy products. Such policy implementation, if effective and monitored properly, would solve most of the inefficiencies in the dairy sector in the long run and would help Sri Lanka to mitigate the adverse effects of global market change.

The effects of DDA however could modify the above-mentioned predictions. Edirisinghe (2008), who examined the possible economic impacts of the DDA on the Sri Lankan dairy market, suggests that the effects of DDA are uncertain. The impacts due to reductions in export subsidies implemented by the exporting countries and import tariff imposed by Sri Lanka on the Sri Lankan dairy economy were tested through simulation. The results indicate that the degree of welfare impacts would depend on the rate of reduction of trade barriers by the countries involved in trade. Supposing that only the reduction of export subsidies takes place at the import source and Sri Lanka does not agree to reduce its tariff levels for dairy products, world market dairy prices would increase hence would domestic prices. Under this scenario, domestic producers would be better off and the consumers would be worse off and a negative impact on social welfare is unavoidable. In contrast, the Sri Lankan dairy economy as a whole will improve if simultaneous reductions in export subsidies and import tariffs take place.

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References:

Bouet, A. and Dimaranan, B. (2008). Impact of bio fuels on global agricultural markets: A preliminary general equilibrium assessment. International Food Policy Research Institute (IFPRI).

Central Bank of Sri Lanka (CBSL). (1999). Consumer finances and socio-economic survey Sri Lanka. Part II. CBSL.

Central Bank of Sri Lanka (CBSL). (2005). Consumer finances and socio-economic survey Sri Lanka. Part II. CBSL.

Earth Policy Institute (EPI). (2006). Available at: http://cta.ornl.gov/bedb/biofuels.shtml. downloaded 28 April 2008].

Edirisinghe, E. M. A. A. (2008). The impact of Doha Development Agenda on the Sri Lankan dairy market. University of Peradeniya, Sri Lanka.

Food and Agriculture Organization (FAO). (2007). Food outlook: Global market analysis. Available at: http://www.fao.org/docrep/010/ah876e/ah876e09.htm. [downloaded 18 April 2008].

FAO Statistical database. (2008). Available at: http://faostat.fao.org/default.aspx. [downloaded 18 April 2008].

Food and Agricultural Policy Research Institute (FAPRI). (2005). World dairy products: FAPRI 2006 agricultural outlook. Available at: http://www.fapri.iastate.edu/outlook2006/text/16Dairy.pdf. [downloaded 30 April 2008].

Foreign Agricultural Service (FAS). (2005). Dairy production and trade developments. United States Department of Agriculture (USDA). Available at: http://www.fas.usda.gov/dlp/circular/2005/05-07dairy/dairyprd.htm#Dairy%20Production. [downloaded 18 April 2008].

Foreign Agricultural Service (FAS). (2007). Dairy: World markets and trade. Available at: http://www.fas.usda.gov/dlp/circular/2007/dairy_12-2007.pdf. [downloaded 18 April 2008]

International Monetary Fund (IMF). (2007). World economic outlook database. Washington, D. C. Available at: www.imf.org/external/pubs/ft/weo/2007/02/weodata/index.aspx. [downloaded 30 April 2008].

Market Access Map. (2008). Available at: http://www.macmap.org/ - 28k. [downloaded 25 April 2008].

Ministry of Livestock Development. (2007). The livestock sector in Sri Lanka. Available at: http://www.livestock.gov.lk/liveenglish/index.php?option=com_content&task=view&id=36&Itemid=152 [downloaded 25 April 2008].

Organization for Economic Co-operation and Development (OECD) Statistical database. (2008). Available at: http://oberon.sourceoecd.org/vl=3045555/cl=12/nw=1/rpsv/home.htm. [downloaded 15 April 2008].

Pingali, P. (2006). Westernization of Asian diets and the transformation of food systems: Implications for research and policy. Food Policy. 32:2881-298.

U.S. Department of Energy. (2006). Biomass energy data book. Available at: http://cta.ornl.gov/bedb/biofuels.shtml. [downloaded 28 April 2008].

World Trade Organization (WTO). (2004). Trade policy review: Sri Lanka. Available at: http://www.wto.org/english/tratop_e/tpr_e/tp228_e.htm. [downloaded 22 April 2008]

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Promoting regional-level liquid milk processing for reducing the distance between milk producer and consumers can be an effective policy instrument for the government in facing future challenges of milk marketing. It is a desirable option as it preserves many nutrients in milk and helps cut down energy costs.

The current programme of promoting liquid milk through sales outlet seems very popular among the public, and it can also be a very cost effective way of milk marketing requiring low energy. However, since milk can easily get spoilt or contaminated, it is necessary that a simple pasteurising process as developed by the Food and Agriculture Organisation is introduced and a mechanism to monitor the sales outlets is devised in collaboration with the health officials and local authorities to ensure food safety and hygiene.

Also, new technologies are available to produce long-life liquid milk with low-cost packaging with low energy use than the present practice of producing bottled sterilised. Promoting such low-cost long-life milk production is another strategy useful to reduce energy costs. These methods are useful as refrigeration costs are avoided and milk can be distributed to remote villages and stored at room temperatures for nearly 3-6 months. These methods will also be useful in the current free milk distribution programme of the government to the children of vulnerable groups between the ages of 2-5 years in very disadvantaged villages.

5. Conclusion

The governments from the time of independence have recognised the importance of the dairy sector in the country and have taken various policy measures for its development. However, the availability of relatively cheap milk powders in the international market and the concerns about the large number of consumers, have prevented the governments in the past from providing the required price incentives for the dairy producers to expand dairy production in the country.

However, the rising global food prices including those of dairy products have increased the competitiveness of local dairy production and have created new opportunities for the domestic dairy industry. It has also created a renewed interest among the dairy farmers as well as the private sector dairy processors for new investments to expand their operations. The past government actions have created a favourable policy environment, but it needs to be consolidated with a few improvements. Certain improvements to the policy framework, which require serious consideration, are suggested if we are to capture the current opportunities for dairy development.

References

Central Bank of Sri Lanka. Various issues of Annual Reports.

Ibrahim, M.N.M, Staal., S.J, Daniel, S.L.A., and Thorpe, W. (1999). Appraisal of the Sri Lanka dairy Sector. University of Peradeniya, International Livestock Research Institute and Ministry of Livestock Development.

Ministry of Livestock Development (2006). National Livestock Development Policies and Strategies.

Ministry of Livestock Development, Sri Lanka Livestock Statistics, various issues.

United Sates Department of Agriculture, Agriculture Marketing Service, various issues of statistical publications.