Improved Market Access and Smallholder Dairy Farmer Participation

for Sustainable Dairy Development

(CFC/FIGMDP/16FT)

LESSONS LEARNED STUDY

MONGOLIA:
Small milk producers:
the key to dairy industry revival

By

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Table of contents

1. Background

With a land area of 1.56 million square kilometres Mongolia is more than three times the size of France. Broadly speaking, moving from the southern border with China to the northern border with Siberia, the country is separated equally into: (i) desert, (ii) desert-steppe and (iii) steppe regions, each with mountain ranges, some rising to well over four thousand metres. Being so far from the sea, the climate is extreme continental with temperatures ranging from as low as minus 45^{o}C on the steppe in winter to plus 40^{o}C in the Gobi desert in summer. The summer growing period is very short; the autumn-winter-spring period, when nothing grows, very long. Less than one per cent of the land is settled or down to crops, but some 71 percent is grasslands used for extensive livestock raising, including hay making and natural pastures. The population is just 2.5 million (2006). Ulaanbaatar, where almost half of the population live, is said to be the coldest capital city in the world.

The livelihoods and wellbeing of the majority of Mongolia's people still depend largely on livestock and on meat and milk in particular. In Mongolia milk is both sacred and a staple food. In the short warm summer season milk is produced in great abundance by some 30 million plus cattle, yaks, camels, horses, goats and sheep, owned largely by small milk producers (see annex 1 for key definitions). Nomadic herding and traditional dairy products making are at the core of Mongolian society providing a significant share of national income and employment. Women play a leading role as they tend the animals and process the milk into traditional dairy products for winter food as well as for earning income from selling the surplus for other basic family needs.

Livestock contribute more than one fifth of GDP and almost half of all employment in what was, until very recently, a predominantly nomadic society. Dairying, in particular, provides much-needed nutrition, regular incomes and jobs and is set to play a major role in helping the country to become more food secure and, in so-doing, supporting the UN Millennium Development Goal seeking to halve poverty and under-nutrition by the year 2015. In Mongolia this means reducing the number of under-nourished people living below the poverty-line from 800,000 to 400,000.

In the socialist period Mongolia used to be self-sufficient in milk. Table 1 shows milk production trends during this period. During the rapid transition to the market-based economy in the 1990s the dairy industry, like other food industries, collapsed and sales of domestic processed milk fell from over 65 million litres in 1990 (approximately 20 percent of milk production) to less than 3 million litres by 2002 (see chart in section 2.2). As a result overall food insecurity worsened and many people lost their livelihoods. Imports of milk and dairy products surged to about 50 million litres of LME annually. By 2002 the dairy industry was characterised by

Table 1: Milk production in Mongolia ('000 mt)

Year	Total milk production	By species			
		Camel	Mare	Cow	**Sheep/goat**
1940	**242.2**	**1.6**	**12.7**	**186.8**	41.1
1950	**240.8**	**2.4**	**12.1**	**183.4**	42.9
1960	**227.7**	**2.3**	**12.2**	**173.5**	39.7
1970	**220.6**	**1.2**	**12.1**	**177.3**	30.0
1980	**225.7**	**1.1**	**7.3**	**194.9**	22.4
1990	**315.7**	**1.0**	**26.1**	**260.2**	28.4

1995	**369.6**	**(1)**	**(1)**	**(1)**	(1)
2000	**375.6**	**(1)**	**(1)**	**(1)**	(1)
2003	**292.4**	**(1)**	**(1)**	**(1)**	(1)
2005	**425.8**	**3.7**	**41.5**	**259.5**	121.1
2006	**479.4**	**3.8**	**43.3**	**285.7**	146.6
(1) Figures not available Source: Mongolia Bureau of Statistics (2006)					

Obsolete infrastructure and technologies, a chronic shortage of trained people and consumer concern about the quality and safety of domestic milk and dairy products; consequently, most of the processed milk sold in urban areas was imported at considerable cost.

Like other countries in the East Asian region, Mongolia is rapidly urbanising and domestic products need to be tailored to modern market tastes, particularly to younger Mongolians. Half the population is under 20 years old and have only experienced imported milk. Even so, the huge wealth of traditional milk products remains an important part of Mongolian culture, and for the livelihoods of nomadic herders, especially during the long harsh winters.

Since the change to the market economy in the 1990s, milk prices are no longer proscribed and fluctuate according to supply and demand. Farmgate and consumer prices vary considerably according to season and to how far milk producers are from the market (see annex III). A five percent tariff on milk powder imports was introduced in 2000 plus 15 percent VAT. In 2006 the Ministry of Food and Agriculture submitted proposals to increase tariffs to 15% on selected food imports, including UHT (Ultra High Temperature) milk. The proposal is still under consideration. In January 2007 VAT was reduced from 15 to 10 percent for all imported and domestic goods. Dairy plants with an annual turnover of more than MNT 15.0 million (USD13,000) now pay VAT in accordance with this new Tax law, which allows payment to be offset against the cost of procuring domestic raw materials such as milk. This is a really supportive measure as 70 percent of costs are for raw milk.

At 134 kg of LME per person per year, milk availability is very high by Asian standards, e.g. in China next door it is only 10-20 kg., with imports currently increasing at annualised rate of 15 percent. A number of private dairy enterprises emerged during the 1990s following liberalisation, including former food and dairy processing *Combinats* (State-owned companies) acquired by the incumbent managers. Some failed; others experienced great difficulty in getting milk, a highly nutritious but highly perishable food, to market. It was reported that up to one third of available milk was ‘lost’ in the post-harvest (after milking) food chain as it could not be moved to markets, or could not be sold because consumers now preferred imports. This encouraged the establishment of two dairy enterprises with business models based on importing subsidised milk powder from developed country surpluses for recombination.

During the great *zuds*[1] at the turn of the century more than 30 per cent (10 to 12 million) of the livestock perished, including nearly all the dairy herd, which had been distributed to former State Farm workers in the 1990s. Given the importance of dairying to the economy, the Government decided to re-stock and modernise the dairy industry to redress the imbalance between milk supply and demand by promoting domestic milk production and marketing under its flagging national *white*

[1] *zuds* are any condition when animals cannot feed themselves by grazing – typically when ice or snow cover pastures.

(milk) revolution' programme. Formulated in 1999 the programme never really took off owing to lack of resources. In 2002 the Government approached the UN Food and Agriculture Organisation (FAO) and Japan for project support to revive the dairy industry[2], initially in the central *aimags* (provinces) where three quarters of the urban population live and the few remaining dairy cattle were located. This would enable milk producers to be linked to the key urban centres of Ulaanbaatar, Darkhan and Erdenet where about half of the population now live. To reduce post-harvest milk losses the project would especially target small milk producing households and farms with 10 to 40 cows adjoining these urban centres as well as more distant nomadic herders by organising milk collection, initially for the under-utilised urban milk processing dairies.

This study is based largely on the achievements and lessons learned during the project, which ran from October 2004 to September 2007. The Government mainstreamed the three project intervention areas of: (i) milk production enhancement, (ii) milk marketing enhancement and (iii) dairy training/capacity building into a new ten-year National Dairy Programme (NDP) for the period 2007-2016. The NDP target is that at least 90 percent of the milk used in the formal market will be produced locally by 2010, up from 2.5 percent in 2003 (see chart). The NDP, which replaced the *white revolution* programme, was approved by Government in October 2006 under Resolution 239/2006. It will be coordinated by the Ministry of Food and Agriculture and implemented using the public-private sector partnership and investment modalities developed under the project.

2. Situation Analysis

2.1 Dairy industry survey (2005)

Due to recent life-style changes from predominantly nomadic to predominantly sedentary, the country is urbanising rapidly. A survey of dairying in the central *aimags* conducted in 2005 by the Mongolian Food Processors Association identified many shortcomings in the dairy food chain. Socio-economic data was collected and analysed from 84 small milk producers (nomadic herders and peri-urban households and farms), 14 dairy processors and 1,200 urban consumers. The survey confirmed that milk production and consumption were characterised by: (i) a relatively small domestic market for processed milk and dairy products, (ii) a huge disparity between rural (200 kg/yr) and urban (58 kg/yr) consumption of milk, (iii) poor quality milk and lack of consumer confidence in local processed milk and dairy products, (iv) over-reliance on imports for urban markets and (v) a vast natural resource base for milk production from the six million or so animals owned by small milk producers that are potentially in milk at any one time. The survey findings are summarised in box 1.

[2] Mongolia-Japan-FAO/UN Special Programme for Food Security project: Increasing the supply of dairy products to urban centres in Mongolia by reducing post-harvest losses and restocking.

Box 1

Socio-economic situation of dairy industry in central aimags and urban markets

Selected findings (2005)

- *annual milk consumption in urban centres is 58 kg LME per person, about one quarter of consumption in rural areas at 200 kg*
- *70% of processed milk consumed in urban areas is imported (approx. 40 kg LME per urban dweller per year), milk quality is an important driver*
- *post-harvest 'losses' confirmed at one third of milk production (approx. 40 kg LME per person per year)*
- *nearly all milk is produced by small producers, but quality is poor because of inadequate milk collection and primary treatment infrastructure*
- *a chronic lack of technical expertise and modern technologies and equipment among dairy operators (producers, collectors, processors etc) – training and capacity building urgently needed*
- *inadequate services for milk producers (health, breeding AI, feed/fodder, management)*
- *number of more intensive* dairy farms doubled to 110 since 2003, owners are inexperienced and lack skills and services*
- *households selling milk have average incomes three times higher than households not selling milk*
- *30% of dairy households are headed by women*
- *no institutional body to represent the dairy industry*

**In the Mongolian livestock context 'intensive' means increased production using local resources, rather than tending towards a high input system*

Source: Baseline Survey-GCSP/MON/001/JPN Dairy Food Security Project by National Food Producers' Association, September 2005)

After liberalisation the old State dairy struggled on with obsolete equipment and inexperienced management. Many of the new processors failed, their competitiveness with subsidised imports constrained by overwhelming difficulties in obtaining: (i) quality local milk from widely dispersed small milk producers, (ii) modern equipment and (iii) packaging materials, and (iv) high interest rates for investment finance and working capital (18 to 30 percent). Two large food and beverage companies, one supermarket-based, the other the main producer of vodka, diversified into producing UHT (Ultra Heat Treated) milk and fruit juices, their business model based on reconstituting imported full-cream milk powder (FCMP), marketed as 'fresh' milk. At that time the cheap milk powder from the west (often subsidised) was readily available at a liquid milk equivalent (LME) cost of about MNT 200 (17 US cents) per litre, about the same price as locally produced milk in summer (see annex III).

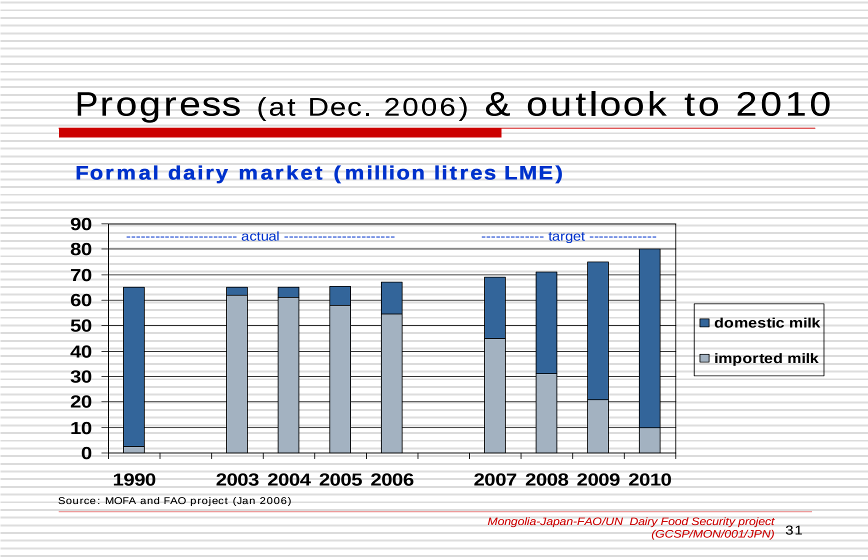
The survey found that the informal milk market was still important for the older generation, though product quality was invariably uncertain. Raw milk and traditional products still accounted for approximately half of urban consumption. The informal market was important not only as a supply of milk and dairy products, but also as a source of regular income and jobs, especially for female-headed households.

2.2 Dairy industry revival strategy

The revival strategy for the dairy sector is founded in current policies for national agricultural development. These focus on improved competitiveness in changing markets through (i) creating favourable business conditions, (ii) improving and sustaining productivity leading to (iii) improved availability of quality milk and dairy products that are safe, affordable and ecologically clean and (iv) application of new technologies for both extensive pastoral and higher productivity farming systems.

A National Dairy Task force representing all public and private sector stakeholders in the dairy industry was set up in 2005 to guide the dairy industry re-building process. The revival strategy was based on a SWOT analysis of the dairy industry (see annex IV). The strategy was approved by stakeholders at a national workshop in May 2005. The strategy embraced a sector-wide, cow-to-consumer dairy food chain approach to be implemented under the following thematic programmes: (i) Milk Production Enhancement, (ii) Milk Marketing Enhancement and (iii) Capacity Building and Training. In line with government policy, the strategy for dairy industry revival was directed initially at the three central *aimags* where: (i) the majority of the urban population lived, (ii) most cattle are found and (iii) the main cropping areas are located and thus crop by-products available for feeding. Initial interventions were based on matching modern technologies and know-how to local market needs in order to: (i) persuade urban consumers to consume more domestic milk and milk products, (ii) reduce post-harvest losses by linking milk producers with consumers through processors (iii) substitute imported milk and dairy products with quality domestic products.

With public and private sector partners the three thematic programmes were operationalised through six commercial dairy modules (or investment packages) covering each link in the cow-to-consumer dairy chain. These are backed up with supporting activities that include: (i) a permanent National Dairy Training Centre at the Food Technology College in Ulaanbaatar, which provides practical, vocational and outreach/field training for each of the modules, (ii) a pioneering dairy cow genetic improvement scheme, (iii) an innovative retailing concept where processors join to sell their products, including certified raw chilled milk and traditional products at the “one-stop” milk sales centres, (iv) the first generic branding and advertising campaign in Mongolia, (v) an innovative public-private sector partnership school lunch programme based on local milk, (vi) working with the food standards and inspections authorities to train and certify milk traders and (vii) setting up the Dairy Steering Group under the Mongolian Food Processors Association to sustain the activities.



Initial results have been encouraging. By mid-2007, sixteen commercial modules/units are in operation with the national dairy programme sharing the investment risks with its partners by contributing up-to-date know-how and limited equipment (approx. USD 350,000). The partners invested about USD 1.3 million in equipment and buildings. The quantity of domestic milk entering the formal market in 2006 was 11.7 million litres, up from 2.5 million litres in 2003. This is expected to increase to 18 million litres in 2007. Private investors, including the two companies reconstituting imported FCMP, are expected to invest upwards of USD 10 million in the modules in 2007 and 2008.

[3] Agricultural Development Strategy of Mongolia (2006-2015), Government of Mongolia, 2006

3. Small Dairy Farmers

3.1 Characteristics

"Smallholder" is not really a term that can be applied in Mongolia because all grazing land is communal, i.e. owned by the State (see annex I for definitions). By law households in city areas are entitled to 0.5 acres of land and those in other areas 0.7 acres. Since the collapse of the State collective dairy farms, small milk producers have dominated milk production. They comprise two main groups: (i) traditional nomadic herder households with mixed herds of up to 200 or more animals and (ii) peri-urban households with up to 20 milking cows in 2003 (see box 2). A growing group (currently 300 plus) of larger dairy farms with 20 to 40 milking cows have been established between 50 and 100 km. from Ulaanbaatar and other urban centres.

Box 2

Mrs. Jargalkhand, Nomadic Herder, Jargalant bag, Mongonmort soum, Tov aimag.

Mrs. Jargalkhand, a nomadic herder from Jargalant bag (village), lives in a remote area of Tov aimag, 200 km from Ulaanbaatar. She heads her household and has two teenage children. She used to be employed by the State Co-operative farm but lost her job after privatisation and was given three milk cows, a few goats and sheep. Since then she has struggled to make ends meet for her family. In 2000 she started to sell milk to a middleman, Mr. T Buuveibaatar, who was then collecting about 2,000 litres of milk daily from 60 households. In 2004 Buuveibaatar worked with the project and set up model milk collecting and milk processing modules. Buuveibaatar now runs a dairy company called Monkhiin Suu (endless milk) and collects 8-10,000 litres of milk daily in the summer from 280 herding households. Some of the milk he processes for sale in nearby Baganuur city, including for schools, some he sells chilled in Ulaanbaatar.

Because she now has an assured market for her surplus milk, Mrs Jargalkhand has been able to invest some of her earning from milk in more cows. She now has ten milking cows and sold 7,200 litres of milk to Monkhiin Suu in 2006 for a gross income of MNT 1,440,000 (USD 1,240). While it is too early to assess the impact of milk on her daily life, she likes the regular daily income that selling milk brings, which she can use for school fees and purchasing other family items such as flour, rice, sugar, matches etc without borrowing money. Mrs. Jargalkhand also appreciates having the Dairy Service Centre and Vet on call to attend to her main assets, her livestock.

Generally speaking, a dairy farm is classified as a small mixed livestock farm within 50-100 km radius from a centrally located area, provincial centre or city, which has winter shelters for cattle and the ability to make hay and fodder. According the 2006 livestock census there are 8,012 dairy cattle kept on 395 dairy farms – an average of 20 animals per farm. Of these, more than 80 percent are located near Ulaanbaatar, the capital city and in Tov and Selenge *aimags*, the main crop areas of the country. Small dairy farmers usually have their own market outlets and deliver raw milk to: (i) milk processing units (ii) food/dairy markets, (iii) small food stores or kiosks and institutions (canteens, hospitals, sanatoria, schools, kindergartens etc).

Revival of the dairy industry in Mongolia depends on small producers and on their capacity to increase production of quality milk at prices that enables processors to compete with imports, both as finished products and as milk powder for reconstitution. Small milk producers are reported to be the most profitable type of farmers in Mongolia (World Bank, 2004). In 2007, milk producers linked to formal markets received between MNT 150 and MNT 300 (12.5 to 25 US cents) per litre for milk in summer, when 80 percent of milk is produced, depending on distance from the market (annex III). In winter they are paid between MNT 350 to MNT 500 (29-42 US cents). Winter prices were not competitive with subsidised imports from Europe until this year when the world wide shortage of FCMP drove LME prices up to over MNT 600 (50 US cents).

The annual December 2006 livestock census reported that 225,400 households (36% of the total) owned on average 152 head of livestock of which 170,800 households (27%) are classified as herding families engaged in livestock raising owning on average 204 head. Rural families with less than 20-50 head of livestock are considered poor households. Herds consist of cattle, horses, camels, sheep and goats. Following more than 15 years of market transition, herding families have started to form groups due to the necessity to work together for marketing their produce such as wool, cashmere, hides and skins, meat and traditional dairy products. The formation of herding groups is largely based on family membership, seasonal pasture location or *bag* (smallest local administrative unit) location (see box 3).

3.2 Traditional dairy food chain model

Traditional dairy products are hugely important. Along with meat they were, until very recently the main foods for nomadic families in the long, cold autumn-winter-spring period (October to May). All the milk is used. When the quantity of milk or by-products is too small to process, it is accumulated over a number of days, allowed to sour naturally, then processed. Though more than one hundred regional varieties are produced, traditional products may be broadly classified as indicated below. Many are unique, e.g. *airag* (beer fermented from mare's milk), where the mares are milked every two hours, night and day during the short summer; and *shimiin arkhii* (vodka distilled from fermented milk). There is also the ubiquitous *Suuthe Tsai* (salt tea) offered by all households to visitors and restaurants to customers.

(1) <u>Fat-based products</u>: e.g. *urum* (cream), *shar tos* (ghee or clarified butter*), tsagaan tos* (white butter from camel and goat milk), *airgiin tos* (cream wafers)

(2) <u>Fermented products</u>: *airag, khoormog* (sour camel milk), *undaa* (fermented drink), *tarag* (yoghurt) *tsegee* (sour milk)

(3) <u>Protein based products</u>: *byaslag* (cheese), *aarts and aaruul* (fermented dried curd), *khuruud , eezgii* (evaporated curd)

These products are produced out on the steppe in summer and by peri-urban households for both domestic consumption and sale. Traders buy and gather the products and either sell directly or wholesale to other retailers in the *Suu* (milk) markets found in all trading centres and urban areas. Though no studies have been carried out, and quality is often highly suspect, it is understood that producing and trading in traditional dairy products is highly profitable. Many of the larger processing dairies now produce and market their own traditional product brands.

3.3 Modern dairy food chain model

The modern dairy food chain model evolved from the lessons learned during the dairy food security project, and is inclusive of all milk producers, irrespective of type and size (nomads, peri-urban households, small dairy farms etc). The model links producers to small and large scale processors with a module for each link in the cow-consumer dairy food chain. There are six vertically integrated modules each capable of being adapted to the local situation and each of which must be profitable. The modules include: (i) milk producer organisations (MPOs), (ii) dairy service centres, operated on a full cost recovery basis by private vets., (iii) milk collection packages, (iv) milk cooling centres, (v) milk processing units and (vi) "One-Stop" milk sales centres. As indicated above, the modules are supported by many innovative training and marketing features, and have been mainstreamed into the National Dairy Programmes for the period 2007-2016.

Box 3
Dr Chantu, Founder-member Nomgon Suu MPO
Nomgon soum, Selenge aimag

Dr Chantu used to be a Government employed vetinerian. He was made redundant when the State farming system collapsed in the 1990s during the abrupt change from State-run to market-led economy. He set up as a private vet and also leased land at Nomgon soum in Selenge aimag for growing wheat. His income rarely covered his expenses so, like other farmers and herders in the area, he added milk production to his farm business. He uses crop residues to feed his cows. In 2005 he became a founder-member of the Nomgon Suu Milk Producers' Cooperative, set up with project support. The project also provided the model MPO with a model Milk Collection module (3-mt truck, milk cans, Lactoscan rapid milk analyzer, training etc.). The MPO currently has 18 members who market around 800 litres of milk and traditional daily products daily in nearby Darkhan City. The MPO has savings of some MNT 300,000 earned from various services provided to members.

In 2006 Dr Chantu was appointed manager of the new model Dairy Service Centre, set up by the MPO to provide its members with these support services. Dr Chantu attended four vocational courses organised by the National Dairy Training Centre on subjects such as Dairy Cow Breeding, Establishment of MPOs and Clean Milk Production. Today Dr Chantu provides MPO members and other farmers and herders in the area not only with animal health and diagnostic services, but also breeding and other support service, including training through the NDTC outreach training programme. Since 2006, he has inseminated more than 300 local cows with Simmental semen provided under the pilot dairy cow genetic improvement scheme. 240 calves are already born. By spreading his risks, Dr Chantu now has a profitable business, driven mainly by earnings from daily milk sales. He strongly believes that his Simmental cross animals perform best under the harsh Mongolian climatic conditions.

The chart in annex II shows the informal and dairy chains that link small herders and dairy farmers with consumers in large urban areas with populations above 25,000, e.g. Ulaanbaatar, Darkhan, Erdenet, Zuunhaara and smaller *aimag* centres with populations from 5,000 to 25,000.

4. Conclusions and Lessons Learned

The SWOT analysis for the Mongolian dairy sub-sector (2005) is still valid (annex IV). The key lessons learned during the re-building process that impact on small milk producers may be summarised as follows:

(1) Revival strategy: adopting a sector-wide, cow to consumer strategy, inclusive of small milk producers, to revive the dairy industry and demonstrating practical modules to ensuring each link in the dairy food chain is profitable.

(2) Constraints into opportunities: basing the strategy on taking advantage of the key *opportunities* available to the Mongolian dairy industry: (i) high per capita consumption, (ii) huge milking herds, (iii) vast grasslands, (iv) imports to substitute, (v) export potential for 'clean' milk to nearby milk deficit markets, to overcome the present *constraints*: (i) low milch animal productivity and poor quality milk; (ii) lack of market access for milk producers, (iii) obsolete infrastructure and equipment, (iv) lack of up-to-date technical know-how and skills.

(3) Committed partners: careful selection of public and private sector partners and collaborators for cost-sharing and responsible ownership of the model dairy demonstration units/modules. Divesting ownership of the old State dairy in Ulaanbaatar revitalised the company.

(4) Policy: ensuring consistency with current Food and Agriculture and tax policies and later, the mainstreaming by MOFA of activities into the new 10-year National Dairy Programme (2007-2016).

(5) Increasing milch animal productivity: rather than more animals is vital to sustainably increasing small milk producer incomes; priority should be placed on services that provide immediate impact such as feeding, artificial insemination using appropriate dual purpose breeds, and animal health, while concurrently introducing genetic breed improvement.

(6) Capacity building: placing priority on establishing a permanent vocational and outreach training facilities – the National Dairy Training Centre – at the Food Technology College in Ulaanbaatar.

(7) Traditional dairy products: their continuing importance and ability to provide good returns to small milk producers and processors.

(8) School lunch (and milk) programme: linking small milk producers and processors as well as larger scale processors to the programme facilitated the dairy sector revival process while, at the same time, introducing/re-introducing children and their parents to the nutritional benefits of local milk.

(9) Earnings and employment: access to milk markets provides nomadic herders and rural households with regular earnings and the dairy food chain provides many rural and urban off-farm jobs, especially for women – up to one job for every 15 litres of milk collected, processed and marketed (box IV).

(10) Dairy equipment and supplies: ensuring appropriateness, affordability and availability, i.e. can be: (i) made and maintained locally, or (ii) imported from nearby counties through local agents.

Box 4
Erdenet Khaan Suu (King Milk) Dairy Company Limited
Erdenet City, Orkhon aimag

The company started business at the end of 2006. It can process up to 5 mt of milk per day and is the only milk processing facility in Erdenet City, now the second largest city in Mongolia. The owner, Ganbold Ariunbileg, invested MNT 500 million (USD 430,000) in milk, ice cream and yoghurt processing equipment from China and Russia. The company employs 138 staff in its milk collection-processing-marketing operations - one employee for every 15 litres of milk. Eighty percent of the staff are women. The project provided a Milk Collection module and, most importantly, training for key technicians, to demonstrate and promote the buying of quality milk from Mongolian milk producers. The company currently buys about 2 mt of milk daily from 15 herders at MNT 200 per litre. Tos (sour cream) and aarts (curd) are purchased from a further 25 herders. The main products are yoghurt and ice-cream, which are marketed in Erdenet (20%), Darkhan (20%) and Ulaanbaatar (60%), some 350 km away.

The natural and flavoured yoghurt lines wholesale at MNT 600 per 500 ml carton (MNT 1,200 per litre) and the ice-cream lines at MNT 100 per 50 ml cone (MNT 2,000 per litre). Turnover is currently MNT 50 to 60 million per month. The company plans to double throughput to 4 mt daily in 2008. It will invest in one of the low-cost model Milk Cooling Centre modules pioneered by the project. From September 2007 the company will supply 10,000 children in Erdenet with milk juices (made with natural Mongolia berries and fruits) under the national school lunch programme. The company also retails it products through the Ulaanbaatar 'One-stop' Milk Sales Centre module in Ulaanbaatar. Due to rising demand, it will also launch a range of fresh and flavoured pasteurised milk and milk-juice lines on to the Erdenet market in 2008.

5. Dairy Strategy Prospects

The transition to the market economy in the early 1990s culminated in today's enterprise-oriented dairy industry, based largely on milk produced by small producers. The strategic lessons and prospects for dairying and small milk producers in Mongolia are listed below. These have been translated into a focussed, actionable strategy - the National Dairy Programme (NDP) - which involves a mix of Government, but mainly private sector investment over the period 2007 to 2016.

(1) Small milk producers: re-building the milk collection-processing marketing infrastructure, with a focus on small milk producers, milk quality and training has driven the dairy revival process. More effort should now be placed on improving productivity at farm level.

(2) Modern dairying model: the sector wide, integrated industry re-building strategy aimed at ensuring each link (module) in the dairy chain is profitable and is encouraging private sector investment

(3) Dairy Institutions: setting up the National Dairy Task Force (re-named the NDP Working Group under Resolution 239/2006) to guide the overall programme, and the enterprise-oriented Dairy Steering Group under the Mongolian Food Processors Association, enhanced co-ordination giving the industry a more powerful voice in promoting local milk by focussing on quality and safety; generic branding, labelling and advertising helped to re-build consumer confidence in local milk.

(4) School milk: promoting local milk and dairy products through the school lunch programme has the dual impact of improving nutrition and providing a market for local milk producers.

(5) Costs and competitiveness: milk production costs and farm-gate prices are now competitive with imported FCMP, notwithstanding the current 5 percent import tariff. Farm-gate prices in summer (12.5 to 25 US cents per litre) for milk produced under the semi-intensive, peri-urban system are competitive with the most efficient western countries, provided western subsidies are discounted. Producer prices are even lower for milk produced by herders and small producers in more remote areas.

(6) Traditional dairy products: will continue to be important, high value added/profitable products. The potential to export Mongolia's unique mare milk-based and camel milk-based functional foods should be explored under a "green" ecological generic brand/label.

(7) Legislation: updating domestic and import tax legislation promoted domestic milk processing, e.g. the VAT paid by milk processors can now be offset against cost of procuring domestic milk.

(8) Future growth prospects: due to the already high milk availability and consumption levels, at least by Asian standards, once imports are replaced and urban consumption levels increased, market growth is expected to stabilise around 2 to 3 percent per annum, assuming disposable incomes continue to grow. With the recent growth of the mining and tourism sectors Gross National Income, while still low by western standards, has been expanding at about 12 percent annually since 2002 and should be capable of sustaining this modest growth forecast.

(9) Exports: given its small population and high per capita consumption of milk and dairy products, to continue to grow its dairy industry in the longer-term, Mongolia will need to look increasingly to exporting clean, quality, niche dairy products to the rapidly growing markets of milk-deficit countries in the region. This is recognised in the NDP. With its huge milking herds and vast grasslands, Mongolia has a clear international comparative advantage for producing and exporting clean milk to ecologically-conscious markets; hardly any pesticides or animal drugs and no milk-stimulating hormones are used.

(10) Investment: in the short-term, investment is most needed for continuing to modernise and expand milk collection infrastructure and to further improve the productivity and profitability of dairy cows. In the medium-term investments are required to process surplus milk into niche, value-added easily transportable products such as milk powder and processed cheese for export to milk-deficit markets in the North and North-Eastern Asia region.

(11) Socio-economic benefits: the extra regular income for small milk producers, the extra jobs created, and the availability of affordable, safe domestic milk and dairy products for urban consumers should be having an impact on improving livelihoods through better nutrition and reducing poverty. The impact of this on small milk producers and consumers, and in helping Mongolia to achieve its Millennium Development Goals of halving poverty and under-nutrition by 2025, needs to be assessed.

Annex I

Key Definitions

Small milk producer: since "smallholder" is not really a term that can be applied in Mongolia because all land is owned by the State, the term "small milk producer" is used in this study. A small milk producer is a nomadic herder or peri-urban householder with up to 200 livestock (cows, yaks, camels, horses, sheep and goats). Rural families with less 50 livestock are considered as poor families. After 10-15 years of market transition, herders have started to form herding groups due to the necessity to work together for the marketing of agricultural products, such as wool, cashmere, hides and skins, meat and traditional dairy products. Membership of herding groups is usually based on: (i) the family unit, (ii) seasonal pasture location or (iii) the *bag* (smallest administrative unit) location.

Small dairy farmer: someone who: (i) possess 10 to 40 cows, (ii) lives within a 50 to 100 km radius from the *Soum* (district) centre, the *aimag* centre or a city, (iii) possesses winter shelters for cattle and (iv) is able to prepare hay and fodder for winter feeding. Small dairy farmers usually have their own market outlets and deliver raw milk to: (i) milk processing units (ii) food/dairy markets, (iii) small food stores or kiosks and (iv) institutions (canteens, hospitals, sanatoria, schools, kindergartens etc).

Informal milk market: refer to direct cash sale of raw milk and traditional dairy products at a food market or home delivery by farmers and herders themselves or by middlemen-milk collectors, who deliver milk to small family shops, stands, local kindergartens, canteens, hospitals without any registration or license from the local authorities.

Formal milk market: industrial utilization of milk by processing plants and units (milk collection, transportation, reception, processing with various equipment lines, packaging, ready products, distribution networks, returns and others). The quantities of raw milk sold as a raw material, which is processed and sold as a finished product are registered and included in the official statistical monthly and annual bulletins.

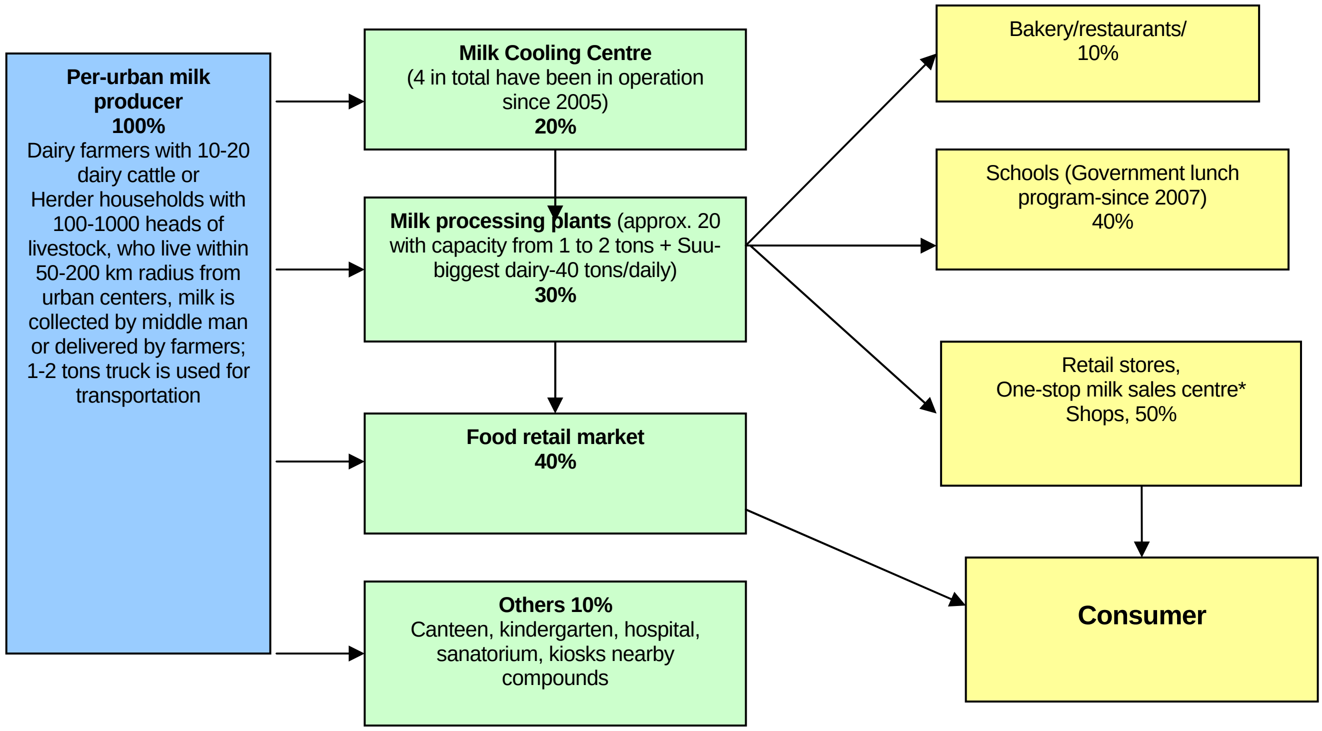
Home retention: spillage, spoilage, forced consumption (no access to market), winter consumption of traditional dairy products with long shelf life, such as: *aaruul, aarts, eezgii, shar, tsagaan tos* (see below), given free to visitors, relatives, milk available, but not milked, in some places and regions horses, goats and sheep traditionally are not milked. <u>Note:</u> in traditional way of milk processing the definition of *spoilage* can not be used, because the non-treated milk is collected gradually for natural fermentation in bulk container (skin sack, wooden barrel, plastic drums) for further processing into products like *aaruul* (dry curd), *aarts* (semi-dried curd), *shimiin arkhii* (milk vodka), eezgii (evaporated curd in own whey), *shar, tsagaan* and *tos* (melted butter or ghee).

Post harvest milk "losses": surplus milk that producers are unable to sell due to no access to market, which is retained and used at home.

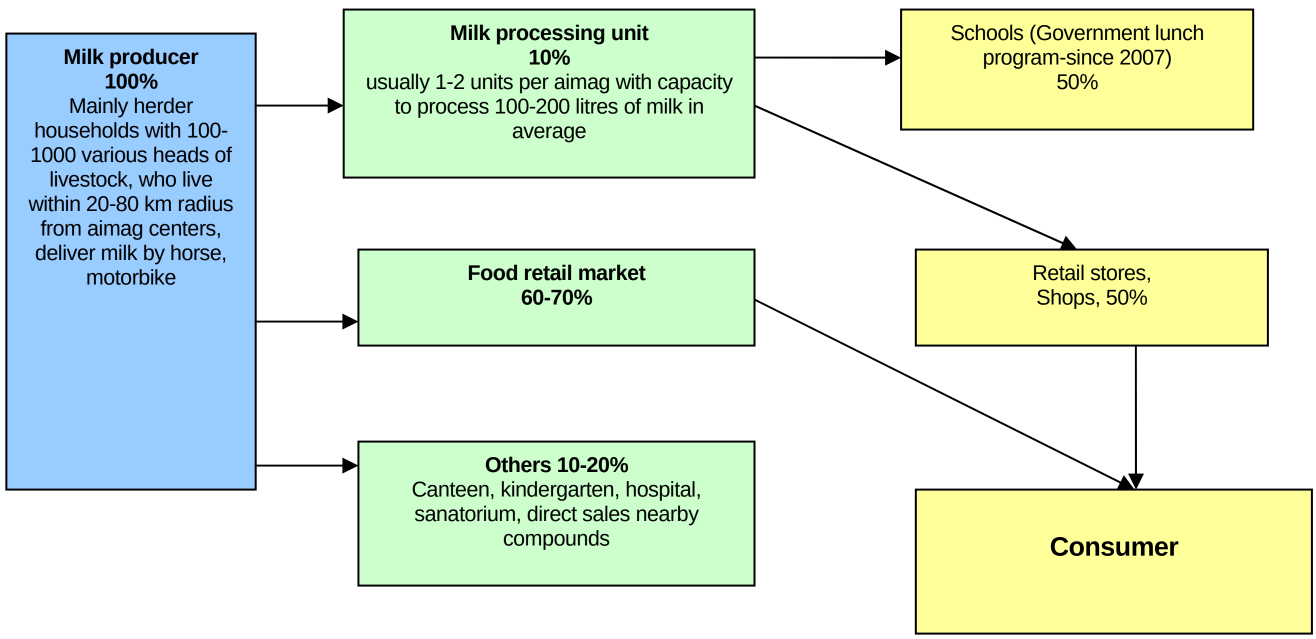
Dairy value chain: refers to the stages in the cow-to-consumer food chain. See Milk Flow Chart in annex II.

Annex II

Milk flow chart at Ulaanbaatar, Darkhan, Erdenet, Zuunharaa-big urban centres



Milk flow chart at Aimag provincial centres (residents are considered as urban dwellers)



Annex III-a

Consumer Milk Price (MNT) by region and season* (2006-2007)

1. Arvayheer- Ovorkhangai aimag Centre (Central region)

	Jan-Feb	March-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
Sheep milk	**-**	**-**	**700-600**	**500**	**-**	-
Goat milk	**-**	**-**	**700-600**	**500**	**-**	-
Cow milk	**-**	**1000**	**700-600**	**500**	**600**	800
Yak milk	**-**	**-**	**700-600**	**500**	**600**	-
Mare milk	-	-	1000-700	600-800	800-900	-

2. Ulaangom- Uvs aimag Centre (Western region)-29.600 residents

	Jan-Feb	March-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
Goat milk	**-**	**-**	**400**	**300**	**-**	-
Cow milk	**700**	**500**	**350**	**300**	**400**	500
Mare fermented milk-airag	-	-	-	900-1000	1000	-

3. Dalanzadgad-Omnogobi aimag Centre (South region)-32.400 residents

	Jan-Feb	March-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
Sheep milk	**-**	**-**	**-**	**500-800**	**-**	-
Goat milk	**-**	**-**	**-**	**800-1000**	**-**	-
Cow milk	**-**	**-**	**700-600**	**600-700**	**600-700**	600-700
Camel milk	**-**	**-**	**1200-1000**	**-**	**1000-1200**	1000-1200
Mare fermented milk-airag	-	-	-	1000-800	800-1000	-

4. Choibalsan- Dornod aimag Centre (Eastern region) - 53.600 residents

	Jan-Feb	March-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
Cow milk	500	500	300	300-400	400-450	500

5. Ulaanbaatar- capital city-965.300 inhabitants

	Jan-Feb	March-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
Cow milk	**500-600**	**500**	**400-300**	**300-400**	**400**	500
Fermented mare milk-airag	-	-	-	1000-800	800-100	-

6. Darkhan- second city-82.400 inhabitants

	Jan-Feb	March-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
Cow milk	**500-600**	**500**	**400-300**	**200**	**300-400**	450-500
Fermented mare milk-airag	-	-	-	1000-800	800-100	-

* Average retail market price for 1 litre of milk; 100-150 MNT is added to the farmgate price for informal market sales; milk processors pay 50-100 MNT less, if they have permanent supplies or own farms.

Source: Provincial Food and Agriculture Agencies, August 2007 (data incomplete)

Annex III-b

Milk Price in Ulaanbaatar, capital city-main dairy market (1990-2007)

Year	Farmgate (MNT/litre)			Consumer (MNT/litre)			Local Milk powder price (MNT/kg)	Ave exchange rate (MNT : USD)
	Low	High	Ave.	Raw	Past.	UHT*		
1990								
1991								
1992								50 MNT
1993								200 MNT
1994								400 MNT
1995	150.0	400.0	250.0	300.0	400.0	-	1500.0	400 MNT
1996	150.0	400.0	250.0	300.0	400.0	-	1500.0	700 MNT
1997	150.0	400.0	280.0	300.0	400.0	-	1800.0	800 MNT
1998	150.0	400.0	280.0	300.0	400.0	-	1800.0	800 MNT
1999	200.0	400.0	285.0	300.0	400.0	-	1800.0	800 MNT
2000	200.0	400.0	290.0	300.0	400.0	-	2000.0	1000 MNT
2001	200.0	400.0	330.0	400.0	500.0	-	2000.0	1000 MNT
2002	200.0	400.0	350.0	400.0	500.0	-	2000.0	1000 MNT
2003	200.0	400.0	350.0	400.0	500.0	700.0	2200.0	1160 MNT
2004	200.0	400.0	385.0	400.0	500.0	700.0	2500.0	1170 MNT
2005	200.0	450.0	390.0	400.0	600.0	800.0	2800.0	1190 MNT
2006	200.0	450.0	395.0	500.0	600.0	850.0	3000.0	1160 MNT
2007	250.0	450.0	395.0	500.0	650.0	900.0	3500.0	1180 MNT

* First UHT plant with Tetra Pak packaging was started by New Zealand-Mongolia joint company in Jan. 2003

Source:

“Suu” Milk shareholding company, “Monsuu”Co.Ltd, “GUM”Co.Ltd.-main dairy companies operated in Ulaanbaatar. Selected available data. Aug. 2007

Mongol Bank- Central Bank of Mongolia.

Annex IV

Mongolia Dairy Sub-sector SWOT

Strengths	***How to Build on Them***
• Milk availability/consumption (135 kg per capita per year) is high by Asia standards.	• Continue to build milk and dairy product consumptions levels, especially in urban areas.
• Long tradition of cattle and livestock keeping; large base of cattle, yaks, camels, sheep and goats for milk production.	• Focus milk production activities on enhancing productivity and hence profitable investments at herder/farm level.
• Investment in 10 to 40 cow dairy farm units is profitable by Mongolian farming standards.	• Use farmer-to-farmer extension methods to publicise success stories.

Weaknesses	***How to Correct Them***
• Milk marketing: (i) relatively small dairy market; (ii) rural people consume four times as much milk as urban people, who are wary of the quality of local milk and dairy products, especially traditional dairy products; (iii) poorly developed cold chain.	• Focus on improving the quality and attractiveness of Mongolian milk and dairy products. • Start a national milk promotion campaign focuses on: (i) improved food security (ii) the nutritional quality of Mongolian milk and dairy products. • Include milk nutrition scheme in school lunch program
• Post harvest milk losses are very high: estimated at 40 kg per capita per year.	• Focus on restoring milk collection and processing infrastructure. • Provide more economically profitable model demonstration units linking rural milk producers-herders/farmers with milk processing facilities
• Milk collection and processing: (i) infrastructure fragmented and very run down; (ii) inadequate number of milk chilling and processing centres; (iii) obsolete equipment and technologies; (iv) fragmented and weak financial standing of main dairy enterprises (v) chronic lack of technical and management skills.	• Find more funds for restoring milk collection and processing infrastructure. • Provide more resources for capacity building and training. • Produce information packages on small and medium scale milk processing sets (equipment and supplies) through sector oriented magazines, websites and other advocacy sources.
• Milk production: (i) is highly seasonal; (ii) limited experience in modern dairy farming and lack of technical skills; (iii) chronic lack of improved, adapted dairy cows; (iv) general unwillingness among dairy farmers to co-operate.	• Encourage winter milk production through price incentives, staggered breeding and fodder conservation. • Set up affordable, sustainable dairy cattle breed improvement scheme. • Strengthen dairy sub-sector organisations and NGOs. • Mobilise more resources on restocking of dairy cattle by importing high productive animals, capable to adapt easily to the local conditions
• Dairy training: (i) lack of technical and vocational training (ii) lack of product development/adaptation facilities for dairy operators and milk producers	• Set up needs based vocational training programme at National Dairy Training Centre, including training of trainers from provincial extension centres.

	• Organise outreach training delivery system • Set up demonstration dairy for practical training and product development.

Opportunities	***How to Exploit Them***
• Rapidly growing urban markets.	• Focus on urban consumers in main UB market.
• Import substitution.	• Promote Mongolian milk and dairy products. • Additional investment in milk quality improvement and consumer education • Regulate against unfair completion. • Support domestic dairy industry by creation of favourable legal environment (VAT, profit tax deduction and etc.)
• What to do with surplus milk once the Mongolian market is satisfied?	• Explore potential to export milk and dairy products to nearby milk–deficit countries, e.g. China where per capita milk availability is just 9 kg per capita per annum and the dairy market growing at an annualised rate of more than 30 percent.

Threats	***How to Avert Them***
• Milk and dairy product imports are accelerating (currently approx 20 kg per capita per year) • Many imports are subsidised by the exporting countries and near or past their sell by dates. • Disorganised food control and inspection	• Work with Government to regulate subsidised imports and introduce measures to control low quality imports. • Support equipping of food control laboratories and re-training of food inspectors.
• Lack of affordable milk collection and processing equipment of appropriate capacity and employing appropriate technologies.	• Encourage local fabrication of appropriate equipment. • Set up local procurement channels for importing necessary equipment.
• Extremely challenging climatic conditions and limited milk production in winter	• Encourage calving for winter milk production through AI and incentive payments for milk. • Promote fodder conservation.
• Lack of capital to develop dairy farms and milk processing enterprises; very high interest rates for loans; unfavourable tax regime.	• Set up dairy development fund. • Work with Government and stakeholders to set up conducive investment environment for developing the domestic dairy sub-sector.
• Government disinvestment in provision of dairy services.	• Set up self-financing Dairy Service Centres close to producers, with full cost-recovery.
• Livestock are perceived in some quarters to degrade the environment through overgrazing, especially goats whose number are increasing.	• Include environment protection issues in training programme. • Mount campaign to change perceptions.

Source: Inception Report. Mongolia-Japan-FAO/UN FAO Special Programme for Food Security project: *Increasing the Supply of Dairy Products in Mongolia by Reducing Post-Harvest Losses and Re-stocking: GCSP/MÔN/001/JPN* (Tsetsgee Ser-Od and Brian Dugdill, May 2005)

Annex V

List of available publications/articles about the dairy development in country

- Proceedings of the theoretical and practical workshop on “Milk and dairy products”. Ulaanbaatar, 2000.
- Proceedings of the International Symposium “Nomadic Cultural Traditions- Mongolian National Dairy Products”. Ulaanbaatar, 20 September 2002.
- Proceedings of the inception workshop. GCSP/MON/001/JPN Dairy Security Project. May, 2005
- R.Indra, Ts.Batsukh. Milk and dairy products. Ulaanbaatar, 2007
- L.Damdinsuren. Scientific and technological aspects of food industry. Ulaanbaatar, 2006
- Ts.Batsukh. Food consumption: tradition and cultural heritage of Mongols. Ulaanbaatar, 2007
- Mongolian Food Producers Association. Baseline survey on behalf of the GCSP/MON/001/JPN Dairy Security Project. Final report. Ulaanbaatar, 2005
- Brian Dugdill, S.Tsetsgee. Oct. 2006. IDF 27th International Congress and World Dairy Summit. Paper on Mongolia: milk production, processing, consumption and outlook 2010.
- A practical guide for establishing milk producers groups-Manual Milk Producer Group Resource Book. GCSP/MON/001/JPN Dairy Security Project. Ulaanbaatar, 2006.
- Manual for milk traders. Improve the Quality of Your Milk and Please Your Customers. GCSP/MON/001/JPN Dairy Security Project. Ulaanbaatar, 2007.
- Practical manuals for milk producers and processors (1-6 volumes). Rural Agribusiness Development Program. MercyCorps-Mongolia. Ulaanbaatar, 2005.
- GCSP/MON/001/JPN Dairy Security Project documents: Working papers, technical reports, annual, semi-annual progress reports, terminal report. 2004-2007
- Agricultural Development Strategy of Mongolia (2006-2015), Government of Mongolia, 2006