Highlights on four livestock sub-sectors in Kazakhstan

The dairy sub-sector

THE DAIRY SUB-SECTOR

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ACRONYMS

ACC	Agro Credit Corporation
ACEPAS	Analytical Centre of Economic Policy for the Agricultural Sector
ACP	Agricultural Competitiveness Project
ADG	average daily gain
AE	agricultural enterprise
AI	artificial insemination
AWEX	Australian Wool Exchange
CIP	carriage and insurance paid
CIS	Commonwealth of Independent States
CKD	centre for knowledge dissemination
CPI	Consumer Price Index
CU	Customs Union
DOC	day-old chick
DP	duty paid
ELISA	enzyme linked immunosorbent assay
EMI	AWEX Eastern Market Indicator
EU	European Union
FAS	Foreign Agriculture Service
FCC	Food Contract Corporation
FCR	feed conversion ratio
FMD	foot-and-mouth disease
FOB	free on board
GAIN	Global Alliance for Improved Nutrition
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GEF	Global Environment Facility
GlobalGAP	Global Partnership for Good Agricultural Practice
GMP	good management practice
GPS	Global Positioning System
HACCP	Hazard Analysis and Critical Control Points
HHF	household farm
HPAI	highly pathogenic avian influenza
ICT	information and communication technology
IFI	international financial institution
ISO	International Organization for Standardization
ISTC	International Science and Technology Center
IWTO	International Wool Textile Organization
JSC	joint stock company

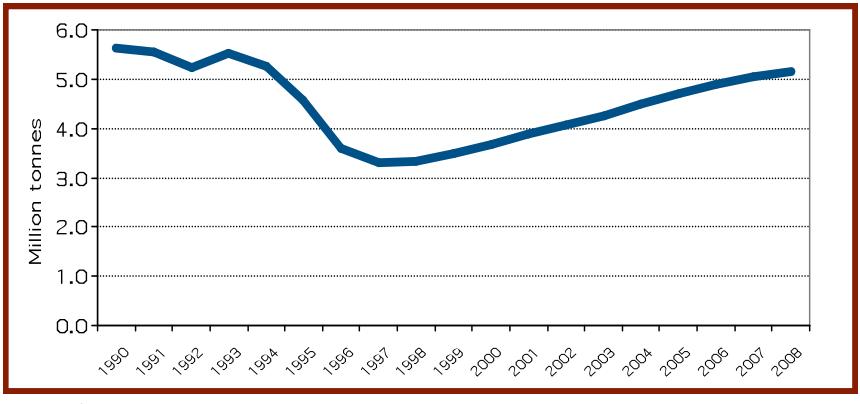
KAF	Kaz-Agro-Finance
KAI	Kaz-Agro-Innovation
KAM	Kaz-Agro-Marketing
KPI	key performance indicator
Kaz-Memst	Committee for Technical Regulation and Metrology
LEI	Agricultural Economic Institute at Wageningen University in the Neterrlands
LLP	limited liability partnership
LSU	livestock unit
LW	live weight
M&E	monitoring and evaluation
MDF	modern dairy farm
MDP	milk and dairy product
MoA	Ministry of Agriculture
MOC	Mal Onimderi State Company
MPE	milk processing enterprise
NWA/C	national wool association/ council
OECD	Organisation for Economic Co-operation and Development
OIE	World Organisation for Animal Health
PF	peasant farmer
R&D	research and development
SBM	soybean meal
SFM	sunflower meal
SPS	sanitary and phytosanitary standards
SZTS	service-purchasing centre
SW	slaughter weight
SWOT	strengths, weaknesses, opportunities and threats
T	tenge
TB	tuberculosis
TBT	technical barriers to trade
TCP	Technical Cooperation Programme
TRQ	tariff rate quota
UHT	ultra-high temperature-treated
UKPF	Ust-Komenogorsk Poultry Farm
USDA	United States Department of Agriculture
VAT	value-added tax
WAHID	World Animal Health Information Database
WAHIS	World Animal Health Information System
WHO	World Health Organization
WME	whole-milk equivalent
WPT	wool primary treatment
WTO	World Trade Organization

A

PRODUCTION AND MARKET OVERVIEW

In 2008, the dairy sector accounted for about 17 percent of Kazakhstan's agricultural gross domestic product (GDP) and 38 percent of its livestock GDP.[1] For the last ten years, the annual volume of milk production has been increasing by an average of 4.5 percent, and has almost returned to the 1990 level (Figure 1). This growth is related mostly to increases in the cow population and in the demand for milk and dairy products (MDPs). Cow productivity has remained stable throughout the country, at an average of 2 253 litres per lactation period.

Figure 1: Milk production, 1990 to 2008



Source: Statistics Agency.

Supply and consumption

Domestic whole milk production was 5.2 million tonnes in 2008.[2] Imports totalled 0.9 million tonnes, or about 38 percent of the national market for packaged dairy products. When carry-over stocks from the

1.- Statistics Agency of the Republic of Kazakhstan.

2.- *Ibid.*

beginning of the year are included, Kazakhstan had about 7.3 million tonnes of MDPs available in 2008.[3]

Some 4.8 million tonnes of MDPs were consumed in 2008, of which 2.3 million tonnes were in the form of packaged MDPs, including 1.4 million tonnes of domestically processed milk. The remaining 2.5 million tonnes are indicated in Table A.1 as unpackaged MDPs, although official statistics do not capture how all of this amount was used. However, it can be assumed (based on the Statistics Agency's household survey for 2008) that about 1.5 million tonnes was for own consumption, and 1.0 million tonnes for other uses.

Table A.1: Milk and dairy product resources and their uses, 2008

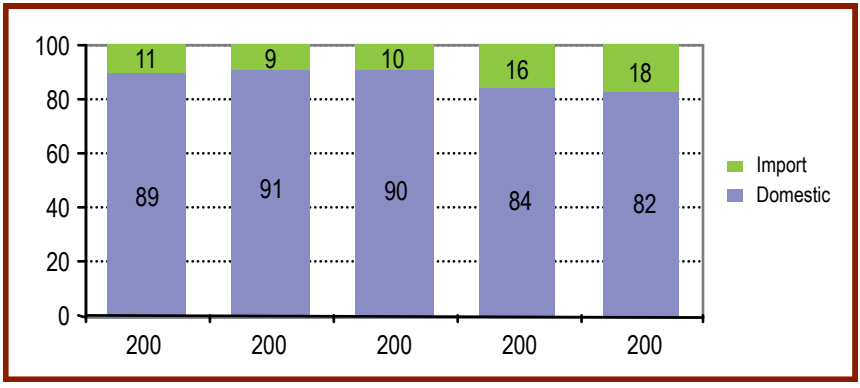
	In whole milk equivalent (WME) ('000 tonnes)	
Resources		
Total domestic whole milk production		5 198.0
Households farms (HHFs)	4 680.0	
Peasant farms (PFs)	347.9	
Agricultural enterprises (AEs)	170.1	
Stocks at beginning of year		1 216.0
Imports		860.0
Total resources		**7 274.0**
Uses		
Livestock feed		644.2
Wastage		36.4
Other industrial uses		0.7
Exports		23.0
Total consumption		4 806.9
Domestic packaged MDPs	1 420.0	
Imported packaged MDPs	860.0	
Unpackaged MDPs[a]	2 526.9	
Stocks at end of year	1 763.0	
Total used		**7 274.2**
Population (average)		**15 674 000**
Consumption per capita, kg/year		
MDPs		**306.7**
Packaged MDPsa		**145.5**

[a] *Own calculation.*
Source: Statistics Agency.

3.- Such a level of carry-over stocks is impressive for this commodity; statistical quotes for the dairy sub-sector appear to include estimation biases, and require further in-depth analysis and elaboration.

Thus, per capita consumption (or availability) of MDPs in Kazakhstan is calculated at 306.7 kg whole milk equivalent (WME). It should be noted, however, that about 18 percent of total consumption is from imports (Figure 2), and 47 percent is packaged MDPs.

Figure 2: Consumption of packaged milk and dairy products from imports and domestic supply, 2004 to 2008



Source: Statistics Agency.

Production of packaged dairy products in 2008 decreased compared with the previous year. Consumption of ultra-high temperature-treated (UHT) milk is rapidly increasing, and is forecast to rise by a third by 2012, overtaking the consumption of pasteurized milk[4]. In Kazakhstan, Most UHT milk is currently produced from reconstituted milk powder, of which 83 percent is imported.

MDP statistics and data indicate that there is a significant supply of unpackaged MDPs in Kazakhstan. A pragmatic investment direction for Kazakhstan's dairy sector should therefore focus on facilitating, improving and increasing the supply to processors of quality fresh milk from domestic farms, especially small farms, which are a largely underutilized source, rather than aim to increase the overall production of fresh milk.

4.- Tetra Pack Central Asia.

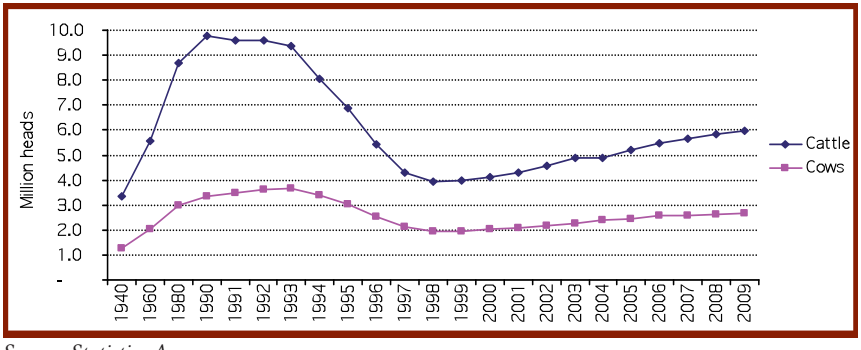
B
PRODUCTION STRUCTURE

Cattle population and farm structure

The cattle population of Kazakhstan amounts to about 6 million head, of which milking cows account for 2.7 million, or 45 percent (2008). About 85 percent of these cows are owned by about 1.6 million household farms, which supply 90 percent of national fresh milk production (4.7 million tonnes). The remaining milk is produced by 16 200 peasant farms and 849 agricultural enterprises.

In the 1990s, the numbers of cattle and milking cows declined by 59 and 42 percent respectively (Figure 3, and Table 1[5] in Annex 1). Throughout the 2000s, however, these populations have increased, by averages of 4.1 percent per year for cattle and 3.2 percent for milking cows. In 2009, the numbers had almost returned to their 1995 levels (of 6.8 million head of cattle and 3.0 million of cows), but were still far behind those of 1990. This growth is related mainly to the increasing demand for MDPs.

Figure 3: Numbers of cattle and milking cows



Source: Statistics Agency.

5.-Here and elsewhere, the tables that are not incorporated in the text are provided in Annex 1. Those in the text are prefixed by a letter – Table A.1, etc.

There are three major categories of farms in Kazakhstan: agricultural enterprises (AEs), peasant farms (PFs) and subsistence household farms (HHFs). Most AEs are the successors of the former kolkhozes and sovkhozes. In 2008, only 849 of a total of 7 217 AEs maintained cattle (Table 2), with a total of 321 200 head. However, the distribution of cattle among AEs was extremely uneven, with 53.2 percent of the AEs (or 452) maintaining 95.8 percent of total cattle (or 307 600 head). These farms therefore had an average of 680 head of cattle each. The remaining 397 AEs (46.8 percent of the total) maintained only 4.2 percent of the cattle (or 13 500 head), with an average of only 34 head per farm.

Most PFs are family farms that emerged after the privatization and segmentation of kolkhozes and sovkhozes. In 2008, of a total of 193 800 PFs (21 600 of which kept livestock), only 16 200 maintained cattle, with a total of 734 800 head (Table 3). The distribution of cattle numbers among PFs is also uneven, with 90.3 percent of the PFs (or 14 600) maintaining about 55 percent (or 403 000 head) of the total PF cattle population, translating into an average of 28 head per farm. The remaining 9.7 percent of PFs (1 600) maintain about 45 percent (or 330 000 head) of the PF cattle population, with an average of 206 head each.

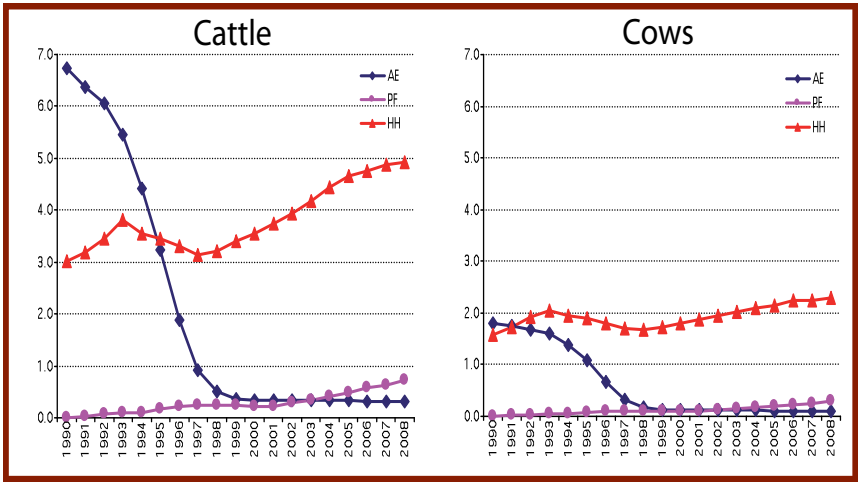
HHFs are the largest category of cattle farms. Some 1 560 000 HHFs hold a total of 4 935 600 head of cattle, accounting for 85 percent of Kazakhstan's total cattle population. HHFs are small personal subsidence plots with an average of 0.15 ha and between one and ten or more cows each. Although, HHFs are the main national producers of livestock products, they are not as well represented in statistics as other farms are, in terms of the structure of their cattle population, production, supply, productivity, breeding, etc.

About 2 500 farms – 849 AEs and 1 600 PFs – can therefore be classified as large cattle farms, with an average of 255 head each; about 15 000 medium-scale cattle farms – 397 AEs and 14 600 PFs – have an average of 28 head each; and more than 1.5 million HHFs are small-scale farms with an average of three head of cattle each.

The numbers of cattle and cows in HHFs and PFs have been steadily

increasing over the last 20 years (Figure 4, and Table 4), while numbers in AEs declined sharply in the 1990s and have continued to decrease gradually over the last ten years.

Figure 4: Numbers of cattle and cows, by farm category, 1990 to 2008 (million head)



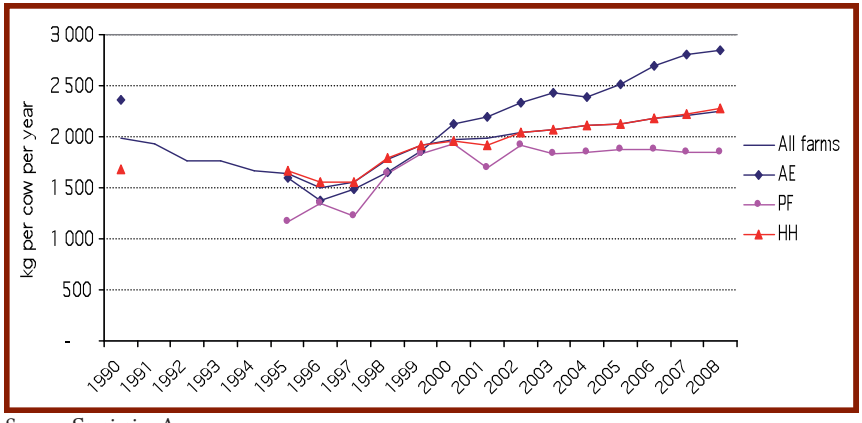
Source: Statistics Agency.

AEs contributed 8.9 percent of total livestock GDP (623 billion tenge [T], or USD5.2 billion), PFs contributed 7.8 percent, and HHFs contributed 83.3 percent.

Milk production and productivity

In 2008, national milk production was 5.2 million tonnes, corresponding to about 1 percent of the global total. Milk yield per cow has been increasing over the last ten years, by an average of 1.8 percent per year. In 2008, it exceeded its 1990 level (of 1 988 kg) and reached 2 253 kg (Figure 5). This level is lower than those of the Russian Federation (3 447 kg) and Belarus (3 966 kg), and significantly lower than those in European countries (5 058 kg) and the United States of America (9 024 kg), but it is comparable to the world average (2 327 kg), and higher than the average in Asian countries (1 582 kg).

Figure 5: Milk yields, by farm category, 1990 to 2008

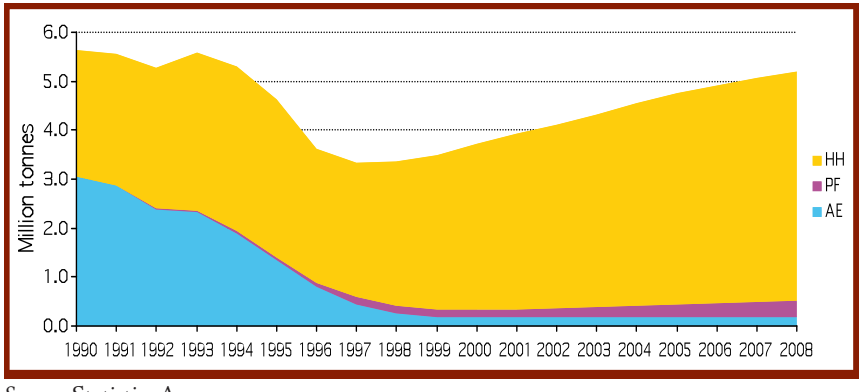


Source: Statistics Agency.

Milk yield per cow in AEs is 25 percent higher than the national average, while that in PFs is 18 percent lower. Because 85 percent of cows are maintained by HHFs, the milk yield from HHFs (2 273 kg) dominates the national yield.

In 2008, HHFs accounted for 90 percent of national fresh milk production (4.7 million tonnes) (Figure 6). The remainder was produced by PFs (6.7 percent, or 0.35 million tonnes) and AEs (3.3 percent, or 0.17 million tonnes) (Table 6).

Figure 6: Milk production, by farm category, 1990 to 2008



Source: Statistics Agency.

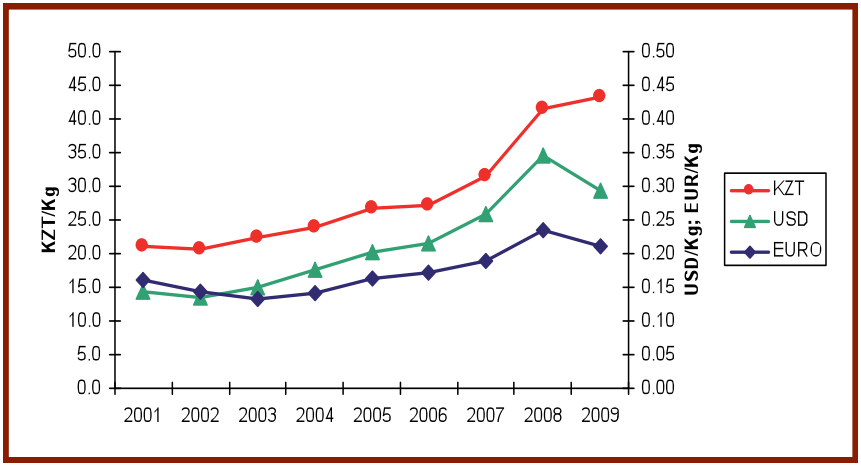
HHFs have dominated milk production since the 1990s, when most cattle ownership shifted from kolkhozes and sovkhozes to HHFs. Such atomized production represents a major supply constraint, as most HHFs are not connected to the dairy processing sector, but are instead oriented towards on-farm consumption and small-scale sales. Milk collection networks are underdeveloped, which reduces the availability of fresh milk for processing.

The increase in milk production observed in recent years is related mainly to the increase in Kazakhstan's cow population and, to a lesser extent, the increase in cow productivity, which still remains low throughout the country.

Prices

The average farm-gate price for fresh milk increased steadily from 2002 to 2006, by an average of 7 percent per year. Growth was even higher in 2007 and 2008, at 16.5 and 31.7 percent, to reach T 31.6 and T 41.6/litre, respectively (Figure 7, and Table 7 for more details). In 2009, however, growth was only 4.2 percent, reaching a price of T 43.3/litre.

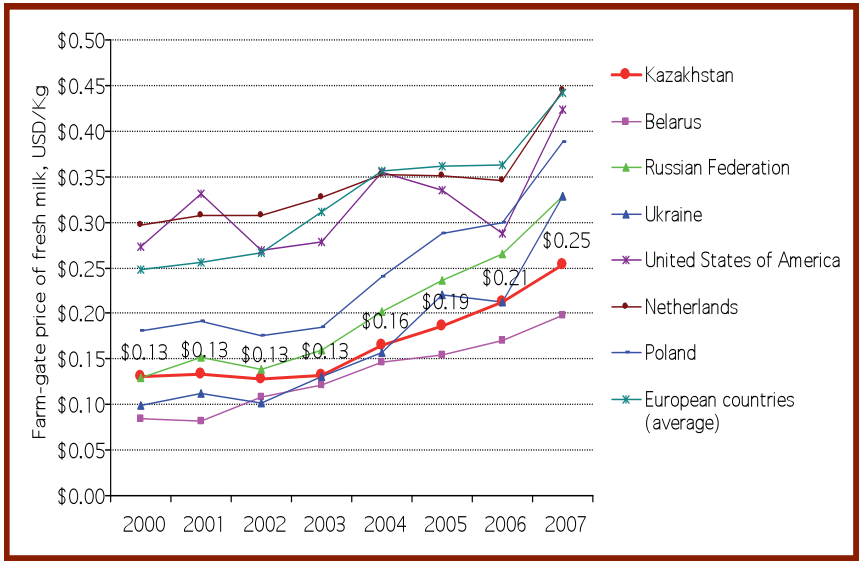
Figure 7: Farm-gate prices of fresh milk, 2001 to 2009 (end of year)



Prices given are the average farm-gate prices for AEs and PFs.
Source: Statistics Agency.

In 2009, the price in United States dollars or in euros decreased, to USD0.29 and EUR 0.21, owing to devaluation of the Kazakh tenge at the beginning of 2009.[6] From 2000 to 2007, the average farm-gate price for fresh milk in Europe was USD0.34 to $0.42/litre (Figure 8).

Figure 8: Farm-gate prices of fresh milk, selected countries, 2000 to 2007

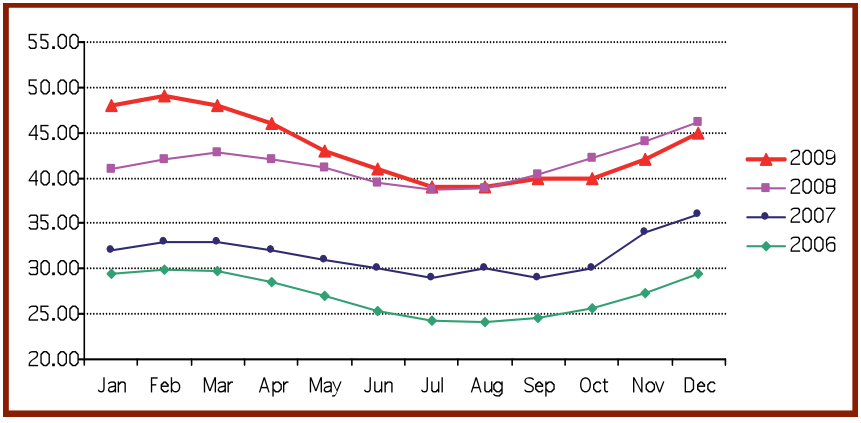


Source: FAOSTAT.

The whole milk price is subject to seasonal variations owing to the seasonality of milk production. It increases in winter, reaching its maximum in February and March, owing to reduced lactation and shortage of feed (Figure 9). The price then decreases in summer, reaching its minimum in July and August, owing to increased milk production. In 2008, the difference between the maximum and the minimum prices for milk was T 4, or about 10 percent of the annual average price. In 2009, this difference was even higher, reaching T 10, although in the second part of the year prices were lower than they had been in 2008.

6.- In February 2009 the exchange rates fell from T 120 to T 150 per USD1 and from T 156 to T 192 per EUR 1.

Figure 9: Price seasonality, 2006 to 2009 (T/kg of fresh milk)



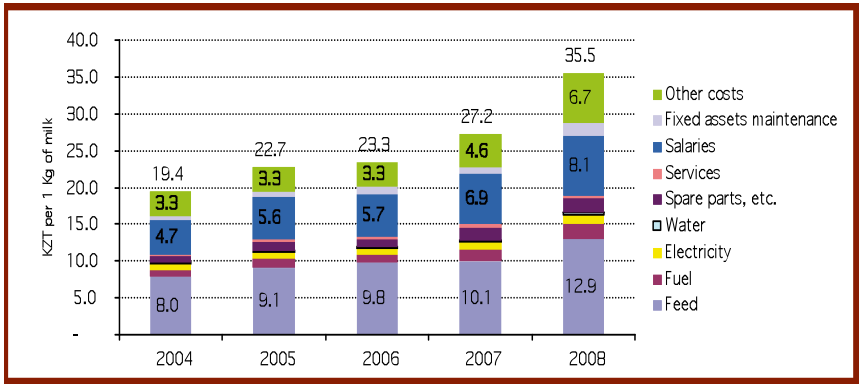
Source: Statistics Agency.

Milk production costs

In 2008, the average production cost for fresh milk in AEs was 35.5 T/kg (Figure 10, and Table 8 for more details). It has been increasing rapidly in recent years. For instance, in 2004 it was only T 19.4/kg – 1.8 times lower than in 2008. The increase was due mainly to increased costs for asset maintenance (3.3-fold), fuel (2.5-fold) and spare parts, repairs and construction materials (2.2-fold). The increases in these costs were apparently the result of upgrading on-farm machinery and equipment and restoring and constructing new cattle sheds. Construction costs included those for the establishment of new modern dairy farms (MDFs)[7], whose high production costs affect the average production costs of all AEs.

7.- The construction of MDFs is initiated and supported by the Government of Kazakhstan, particularly Kaz-Agro National Holding and its affiliated companies. By the end of 2009, a total of 11 MDF projects had been approved, of which four were already completed and operational.

Figure 10: Average production costs of milk in agricultural enterprises, 2004 to 2008



Source: Statistics Agency.

The milk production cost in a newly built MDF is much higher than the average in AEs. It varied from T 52[8] to T 68/kg[9] in 2009, and results from large investments, debt servicing costs and the energy intensity of production in MDFs. Milk from newly constructed MDFs appears to be cost-effective only if the MDF has its own processing unit.

The Statistics Agency has not yet calculated the average production cost of milk from AEs in 2009, but estimates of production costs at some of the AEs visited during field missions imply that it is about T 40 to T 45/kg of fresh milk.

Milk production costs at PFs and HHFs are not available from the Statistics Agency but, based on data collected during field missions, they can be estimated at T 25 to T 30/kg for PFs and about T 25 for HHFs (see section E).

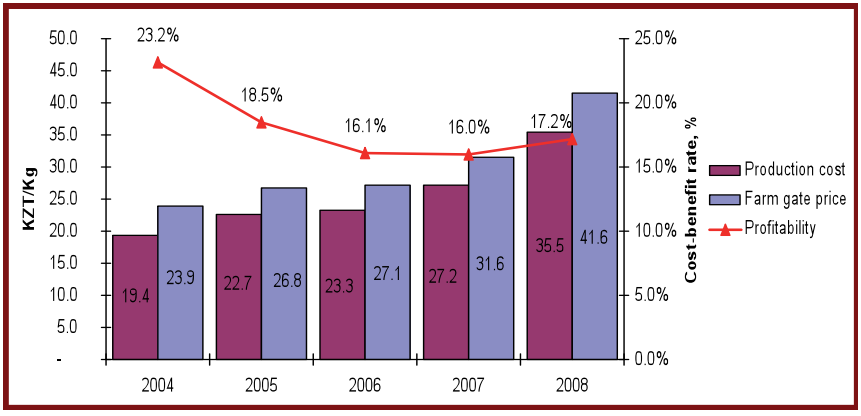
Profitability of milk production

According to the Statistics Agency, the profitability of milk production in AEs was 17.2 percent in 2008, having decreased by about 25 percent since 2004 (Figure 11).

8.- A calculation of the milk production cost at one of the MDFs visited during field survey is provided in Annex 2.

9.- Milk production cost applied by the Ministry of Agriculture (MoA) for feed subsidies at dairy farms.

Figure 11: Profitability of milk production at agricultural enterprises, 2004 to 2008



Source: Statistics Agency.

Statistics on the profitability of milk production at PFs and HHFs are not available from the Statistics Agency but, based on the results of field surveys, it can be estimated at 85 to 90 percent for PFs and 20 percent for HHFs. Profitability at MDFs is estimated to be about 12 percent (see section E).

Under current legislation, the government provides subsidies for enhancing productivity on milk farms. The subsidies are for T 5, T 11 or T 20/kg of fresh milk sold, and are provided to farms that comply with the conditions and requirements. In practice, subsidies go only to MDFs, AEs and some large PFs.

When these subsidies are taken into account, the average profitability of AEs increases to more than 40 percent, that of PFs to 130 percent and that of MDFs to 50 percent. However, the penetration rate of the subsidies is reported to be low.

It should be noted that MDFs have the lowest profitability of all milk farm categories, and require sustained subsidies to improve their turnovers. Obviously, no subsidy scheme can be sustained indefinitely, and operators cannot base their financial management on the receipt of subsidies, nor expect to be eligible for support year after year. Competitiveness and profitability should be based on sound business opportunities, and good technical and financial management.

C
FEATURES OF THE PROCESSING SEGMENT

Number and structure of milk processing enterprises

About 1.4 million tonnes of whole milk was processed in 2008, and an additional 0.9 million tonnes of packaged MDPs were imported. Kazakhstan's capacity for milk processing is about 2.0 million tonnes, but the capacity utilization level is only 70 percent of capacity. Currently, 265 milk processing enterprises (MPEs) operate in Kazakhstan (Table C.1). Of these, 18 are large, 85 are medium-sized, and 153 (or 60 percent of the total) are small. Shares of total processing capacity are 47 percent for large MPEs (capacity more than 30 tonnes per shift), 37 percent for medium-sized MPEs (10 to 30 tonnes per shift), and 16 percent for small-sized MPEs (less than 10 tonnes per shift). A few dairy plants have capacity of more than 100 tonnes per shift; most of these produce UHT milk.

Table C.1: Numbers and capacities of milk processing enterprises

Region	Total							
	No.	Capac ty (tonnes)	Large (> 15 000 tonnes/year)		Medium (3 000–15 000 tonnes/year)		Small (< 3 000 tonnes/year)	
			No.	Capacity (tonnes)	No.	Capacity (tonnes)	No.	Capacity (tonnes)
Akmola	49	193 515	1	21 600	18	125 845	30	46 070
Aktube	21	84 940			7	55 660	14	29 280
Almaty	45	712 493	5	513 320	13	117 495	27	81 678
Atyrau	6	19 220			2	10 200	4	9 020
East Kazakhstan	17	106 006	1	48 000	7	44 300	9	13 706
Jambyl	14	99 000	2	42 500	4	43 100	8	13 400
West Kazakhstan	4	32 693	1	24 800	1	6 250	2	1 643
Karaganda	15	89 422			4	48 600	11	40 822
Kostanay	10	178 628	3	154 600	2	18 000	5	6 028
Kyzylorda	8	8 939			1	4 700	7	4 239
Mangistau	5	8 680			2	7 000	3	1 680

Region	Total							
	No.	Capacity (tonnes)	Large (> 15 000 tonnes/year)		Medium (3 000–15 000 tonnes/year)		Small (< 3 000 tonnes/year)	
			No.	Capacity (tonnes)	No.	Capacity (tonnes)	No.	Capacity (tonnes)
Pavlodar	20	158 100	2	79 000	4	33 400	14	45 700
North Kazakhstan	29	213 217	3	68 500	14	119 860	12	24 857
South Kazakhstan	13	120 000			6	108 000	7	12 000
Kazakhstan	**256**	**2 024 853**	**18**	**952 320**	**85**	**742 410**	**153**	**330 123**
% of total	100%	100%	7%	47%	33%	37%	60%	16%

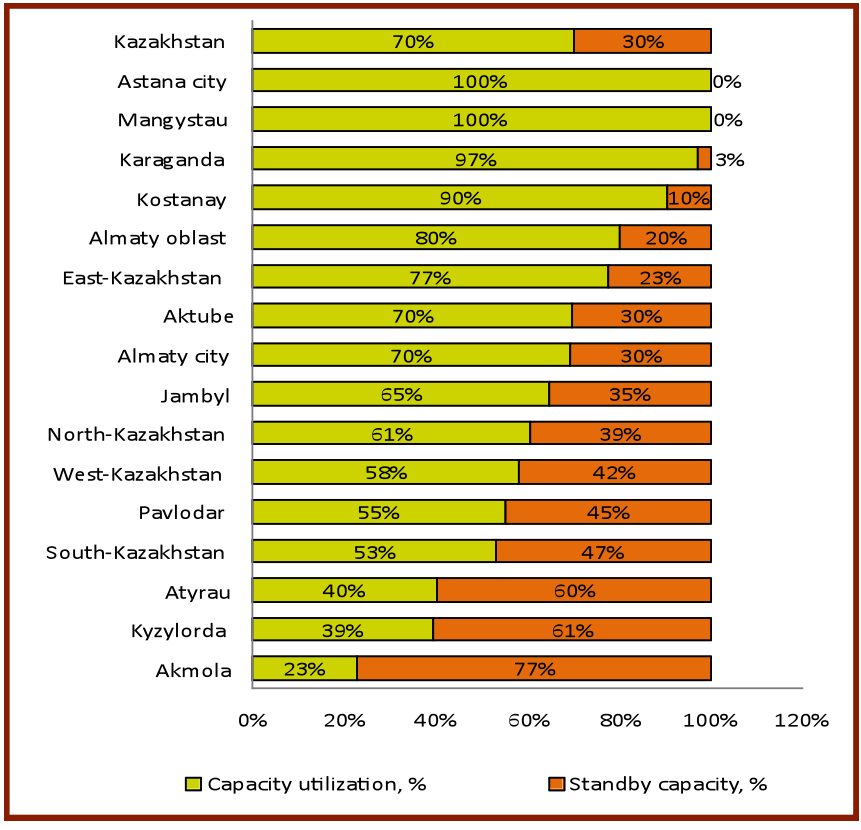
Sources: Statistics Agency; MoA.

According to the Agricultural Census of 2007, there were 91 mini-dairy units, of which 74 percent were with AEs, 23 percent with PFs, and 3 percent with HHFs. Nearly all MPEs were established from old Soviet enterprises, but new small units are opening. Most MPEs have outdated equipment. The regional distribution of dairy plants is generally consistent with the location of suppliers and the availability of fresh milk: almost 75 percent of all processing facilities are located in the northern, eastern and southern regions of Kazakhstan.

Capacity utilization

In 2008, MPEs were working at 70 percent capacity (Figure 12, and Table 5). Dairy processing relies on the availability of whole milk in sufficient quantities and of sufficient quality, while farm production depends on cow productivity and the availability of good-quality inputs at reasonable prices. Recently, trade of dairy products in Kazakhstan has depended more on outsourced milk. To collect more milk, some of Kazakhstan's dairy processing companies (FoodMaster, Vita, etc.) have developed long-term relationships with farms in the Kyrgyz Republic, especially those at the borders of Almaty and Jambyl oblasts.

Figure 12: Milk processing enterprises' capacity utilization



Milk powder supply

Milk powder production has increased by 30 percent over the last five years, while imports have doubled (Table C.2). As a result, the supply to the domestic market increased 2.7-fold. Exports fell dramatically, from 11 300 tonnes in 2005 to only 14 tonnes in 2008, but it should be noted that the main share of exports are re-exports of imported milk powder to third countries.

In 2008, about 150 000 tonnes of processed milk was reconstituted[10]

10.- The conversion factor of milk powder to whole milk is 1 to 7.3.

from 20 500 tonnes of milk powder,[11] of which 125 000 tonnes was from 17 000 tonnes of imported milk powder (83 percent of the total). This accounts for only 11 percent of total domestic processing in 2008. Practitioners estimate that milk powder imports are considerably higher; for instance, almost all domestic UHT milk is considered to be produced from milk powder.

Table C.2: Production, imports and exports of milk powder, 2004 to 2008 (tonnes)

	2004	2005	2006	2007	2008
Production	2 604	4 277	4 444	3 847	3 426
Imports	8 400	21 288	11 048	12 288	17 075
Exports/re-exports[a]	3 459	11 288	1 910	1 836	14
Supply to domestic market[b]	7 545	14 277	13 582	14 299	20 487
Imports on domestic market	4 941	10 000	9 138	10 452	17 061
Share of imports	65.5%	70.0%	67.3%	73.1%	83.3%

[a] *All exports of milk powder are assumed to be re-exports of imported milk powder to third countries.*
[b] *Own calculations.*
Source: Statistics Agency.

In Kazakhstan, seven companies produce milk powder, with a total capacity of 32 tonnes per day, although they currently produce only 6.4 tonnes a year. Owing to the seasonality of milk production, these companies operate at less than 50 percent of their capacity. Some companies produce milk powder for their own processing needs. The poor quality (poor solubility) of locally produced milk powder means it is not in demand in the domestic market. As well as farm-level milk quality, another cause of the poor solubility is the obsolete equipment used by processors.

Three countries – Belarus, Ukraine and the United States of America – supplied 88 percent of milk powder imports in 2009. The average price for imported milk powder was USD3.08/kg, ranging from USD2.66 (from Belarus) to USD4.30 (from the United States) (Table C.3).

11.- Comprising 17 100 tonnes of imports and 3 400 tonnes of domestic milk powder in actual net weight (Statistics Agency, 2008).

Table C.3: Imports of milk powder, by country of origin, 2009

Country of origin	Trade value (USD)	Net weight (kg)	% of total	Price (USD/kg)
Total imports	**35 921 154**	**11 670 945**	**100.0%**	**3.08**
Belarus	14 412 795	5 420 175	46.4%	2.66
Ukraine	7 407 485	2 475 925	21.2%	2.99
United States	10 284 331	2 391 695	20.5%	4.30
Kyrgyzstan	1 685 693	720 405	6.2%	2.34
Moldova	1 111 000	385 000	3.3%	2.89
Russian Federation	438 529	158 725	1.4%	2.76
Poland	187 899	43 000	0.4%	4.37
Germany	177 415	36 048	0.3%	4.92
Italy	159 087	18 620	0.2%	8.54
Netherlands	47 224	16 253	0.1%	2.91
Hungary	7 830	4 500	0.0%	1.74
China	1 866	600	0.0%	3.11

Data apply to imports of "milk in powder/granules/other solid form, fat content by weight not > 1.5 percent".
Source: United Nations Comtrade Database.

The average purchasing price-equivalent of milk reconstituted from imported milk powder is T 63/kg (Table C.4). The highest price is T 88/kg, using milk powder from the United States of America, and the lowest is T 55/kg, with milk powder from Belarus. An estimated 80 percent of milk powder imports are used to make reconstituted milk, with prices ranging from T 48 to T 61/kg. In 2009, the average farm-gate price of domestically produced fresh milk was about T 45/kg. Most domestic milk processors report that they will continue to procure fresh milk from local farms as long as the price does not exceed T 50/kg.

Table C.4: Reconstituted milk prices

Country of origin	Milk powder price (USD/kg)	Conversion factor	Price of reconst tuted milk		
			USD/kg[a]	EUR/kg[b]	T/kg
Average for all imports	3.08	7.3	0.42	0.32	63
Belarus	2.66	7.3	0.36	0.27	55
Ukraine	2.99	7.3	0.41	0.31	61
United States	4.30	7.3	0.59	0.44	88

[a] *USD1 = T 150.*
[b] *EUR 1 = T 200.*
Source: Own calculations.

There appears to be scope for the modernization and rationalization of Kazakhstan's processing system and network, which would certainly benefit from better alignment with the seasonality of fresh milk production and supply and with the demand for processed milk. Diversification of processing patterns may also be needed, to serve domestic demand better. The opportunities for and comparative advantages of increasing domestic milk powder production also merit specific investigation.

Milk collection points

Given that more than 90 percent of national milk production comes from 1.5 million HHFs and 15 000 PFs and AEs, milk processors need a network of milk collection points. Such collection points existed during the Soviet period – when they collected milk mainly from households – because State-owned MPEs faced a deficit of fresh milk, especially in winter. Since the mid-1990s, when most large State-owned dairy farms (kolkhozes and sovkhozes) were privatized and their dairy cattle were distributed among the rural population, the shortage of fresh milk for processors has become critical. The new owners of privatized MPEs have made efforts to restore their enterprises, expand their MDPs and modernize their equipment, but they have not been able to maintain the former milk collection system and network.

Companies such as FoodMaster and Adal are developing networks

of milk collection points in rural areas, establishing cooling tanks from Russian and European manufacturers, and organizing the purchase of milk from rural people and its regular transportation in their own milk tankers.

When setting up a milk collection point in a village, the milk processing companies usually choose the most active local farmer and make an agreement with him/her for the leasing of equipment and the supply of milk. Cooling tanks and other equipment are installed in former rural dairies[12] or specially adapted premises, often in the farmer's own premises.

Processing companies have trained farmers and heads of households on the basics of keeping dairy cows, sanitary and hygiene requirements for milking and milk collection, animals' feeding needs, etc. They have introduced flexible systems of payment for fresh milk, differentiated according to the milk's fat content, acidity and purity.

Although there are no official statistics on milk collection points, it is recognized that several dozen of varying design, capacity and ownership have been established and are operating in Kazakhstan. Milk collection points have also been established in some regions through projects supported by international organizations. In recent years, the Government of Kazakhstan has started to support programmes for developing networks of milk collection points. A few milk collection points have been set up by farmers, most of whom have their own small dairy farms and collect additional milk from nearby farms, including HHFs, to increase the supply of milk to the processors they have contracts with. This allows the farmers to seek better conditions (primarily regarding prices) and establish more stable partnerships with processors. However, there are still too few collection points to collect all the surplus milk from small and remote farms and to meet the demand from milk processors.

Existing milk collection points also face challenges and difficulties, particularly associated with milk quality and the stability of supply from

12.- These small MPEs were established in Soviet times in almost all large villages. They usually processed fresh milk produced by nearby sovkhozs and kolkhozs, producing a small range of simple dairy products, including butter – they were often called "butter making plants". By the mid-1990s, most of these enterprises were no longer operational.

small farms, especially HHFs. Most small farms produce milk with very high bacteria counts and somatic cell contents that are several times higher than the limits under current quality and safety standards for fresh milk. This is partly owing to incorrect animal care, inadequate feeding and relatively high levels of disease among dairy cows (e.g., mastitis), but more to the violation of sanitary standards for milking and for the collection, storage and transportation of fresh milk.

Developing a network of milk collection points is not enough to address this issue. There is also need for unified cold chain systems, which implies the establishment of milk collection points equipped with not only cooling tanks, but also cooling tankers, laboratory equipment, and trained staff and producers. Cold chains will not only expand the area from which milk can be collected, thus absorbing existing surpluses of milk from small farms, but will also significantly improve the quality and suitability of milk for processing.

However, experience shows that milk collection points operate more stably and efficiently when they are part of an MPE. There are few examples of milk collection points operating successfully as separate business entities, as their profitability is very low. Reduction of the purchase price for fresh milk reduces the competitiveness of a milk collection point, and increasing the price for delivered milk may lead to the loss of buyers (milk processors). Although most milk processors state that they are ready to buy fresh milk of acceptable quality in unlimited volumes (especially in winter), they are only willing to do so as long as the price does not exceed T 50/kg. Otherwise, it is more profitable for them to buy imported milk powder.

The decision to invest in milk collection should therefore be made by milk processors; the government can encourage such investments by redirecting and restructuring its public support schemes to the dairy industry. Modernized and equipped milk collection points that are established, owned and directed by processors would enable the creation of effective and sustainable cold chains.

D

MILK AND DAIRY PRODUCTS SUPPLY AND CONSUMPTION

Resources and use

MDP resources include domestic milk production, imports and carry-over stocks at the beginning of the year (Tables A.1 and D.1). In 2008, Kazakhstan had about 7.3 million tonnes of MDPs, one-third more than in 2004 (5.5 million tonnes). This increase was mainly caused by heavily increasing stocks (2.7-fold) and imports (1.9-fold), while domestic production of milk increased less (by only 14 percent).

Table D.1: Milk and dairy product resources and use, 2004 to 2008 (thousand tonnes WME)

Resources	2004	2005	2006	2007	2008
Total domestic whole milk production	**4 556.8**	**4 749.2**	**4 926.0**	**5 073.2**	**5 198.0**
HHFs	4 151.4	4 313.3	4 461.8	4 586.5	4 680.0
PFs	228.7	258.6	281.0	309.1	347.9
AEs	176.7	177.3	183.2	177.6	170.1
Stocks at beginning of year*	449.0	714.4	630.9	699.3	1 216.0
Imports	449.9	431.9	472.6	764.2	860.0
Total resources	**5 455.7**	**5 895.5**	**6 029.5**	**6 536.7**	**7 274.0**
Uses					
Consumption	4 092.0	4 585.1	4 666.6	4 647.8	4 806.9
Domestic MDPs *	1 000.0	1 250.0	1 400.0	1 500.0	1 420.0
Imported MDPs	449.9	431.9	472.6	764.2	860.0
Unpackaged MDPs, etc. *	2 642.1	2 903.2	2 794.0	2 383.6	2 526.9
Fed to stock	579.8	587.5	596.9	601.5	644.2
Wastage	27.3	29.5	30.1	30.4	36.4
Other industrial uses	0.5	0.6	0.6	0.6	0.7

Resources	2004	2005	2006	2007	2008
Export	41.7	62.0	36.0	40.2	23.0
Stocks at end of year	714.4	630.9	699.3	1 216.1	1 763.0
Total used	**5 455.7**	**5 895.6**	**6 029.5**	**6 536.6**	**7 274.2**
Population (average), millions	**15.0**	**15.1**	**15.3**	**15.5**	**15.7**
Consumption per capita, kg/year					
Total MDPs	272.6	302.7	304.8	300.2	306.7
Unpackaged MDPs* *	176.0	191.7	182.5	154.0	161.2
Share in total MDPs *	64.6%	63.3%	59.9%	51.3%	52.6%
Packaged MDPs* *	96.6	111.0	122.3	146.2	145.5
Share in total MDPs *	35.4%	36.7%	40.1%	48.7%	47.4%
Imports in consumption* *					
Per capita* *	30.0	28.5	30.9	49.4	54.9
Share in total MDPs *	11.0%	9.4%	10.1%	16.4%	17.9%
Share in packaged MDPs *	31.0%	25.7%	25.2%	33.8%	37.7%

** This level of carry-over stock is impressive for this commodity; statistical quotes of the dairy subsector appear to have several estimation biases and require further in-depth analysis and elaboration.*

** * Own calculations.*

Source: Statistics Agency.

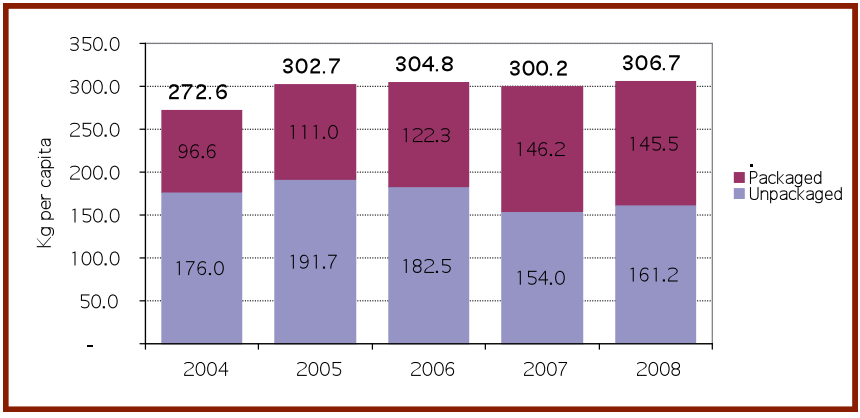
Resources and uses of MDPs include human consumption, feeding to stock, exports, other industrial uses, wastage and stocks at year end. MDP resources increased significantly in 2008 compared with 2004, mainly owing to increased stocks and imports, and increased production of packaged MDPs (1.4-fold).

The uses of the 2.5 million tonnes shown in Table D.1 as unpackaged MDPs are not included in official statistics. Based on a Statistics Agency survey of 2008, it can be assumed that about 1.5 million tonnes were used for self-consumption, and 1.0 million tonnes for other purposes. Other uses and their shares are not included in the statistics, so require further investigation.

For 2008, the per capita consumption (or availability) of MDPs in Kazakhstan is therefore calculated at 306.7 kg WME (Table D.1 and Figure 13), which is one of the highest rates in the world[13], twice as high as that in the Netherlands.

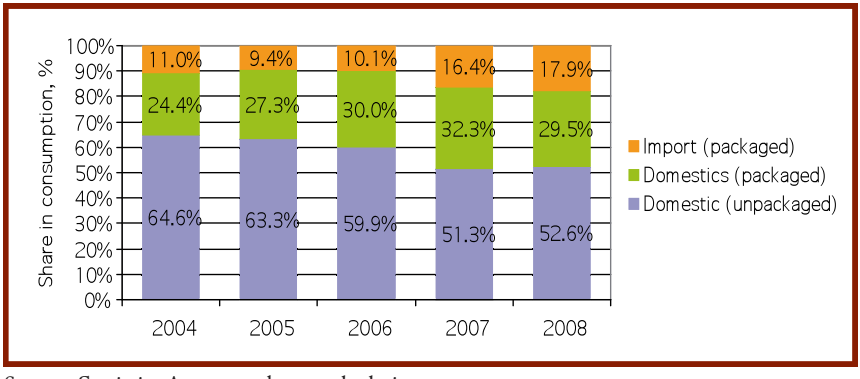
13.- FAOSTAT, 2005: http://faostat.fao.org/.

Figure 13: Per capita consumption of packaged and unpackaged milk and dairy products, 2004 to 2008 (kg WME)



Source: Statistics Agency and own calculations.

Figure 14. Consumption of packaged milk and dairy products, imports versus domestic supply, 2004 to 2008 (WME)



Sources: Statistics Agency and own calculations.

Per capita consumption of packaged MDPs increased from 96.6 kg in 2004 to 145.5 kg in 2008, accounting for 35.4 percent of total MDP consumption in 2004, and 47.4 percent in 2008. In 2008 supply of packaged dairy products decreased compared with the previous year. Cheese and cottage cheese production declined by 4.2 percent, butter by 14.9 percent, and milk powder by 10.9 percent.

Per capita consumption of unpackaged MDPs showed the opposite trend, decreasing from 176.0 kg (64.6 percent of total MDP consumption) to 161.2 kg (52.6 percent) during the same period. It should be noted however that in 2008, 17.9 percent of total consumption came from imports (Figure 14). Consumption of domestic MDPs accounted for 82.1 percent: 29.5 percent for packaged plus 52.6 percent for unpackaged.

Production of packaged MDPs increased steadily in the mid-2000s, resulting in a production level for 2007 that was 50 percent higher than that of 2004 (Table D.2). However, in 2008 and 2009, production of almost all categories of packaged MDPs decreased significantly, resulting in a 2009 production level 15 percent lower than that of 2007. The production of butter decreased by 25 percent, cheeses and cottage cheese by 19 percent, and milk and cream powder by 26 percent.

These decreases were reportedly caused by the economic crisis and consumers' reduced purchasing power. However, apparent reasons also include a relatively low competitiveness of domestic milk processing companies, which in turn would result from inadequate procurement systems, the high costs of fresh milk collection and transportation, and perhaps – as some processors allege – quality issues for domestic whole milk.

Table D.2: Domestic production of packaged milk and dairy products, 2004 to 2009 (tonnes)

MDP	2004	2005	2006	2007	Increase 2004–2008	2008	2009	Decrease 2008– 2007
Pasteurized milk and cream	154 412	179 673	225 816	258 733	68%	262 124	235 156	-9%
Growth rate	-	*16.4%*	*25.7%*	*14.6%*	-	*1.3%*	*-10%*	
Milk and cream powder	2 604	4 277	4 444	3 847	48%	3 383	2 861	-26%
Growth rate	-	*64.2%*	*3.9%*	*-13.4%*	-	*-12.1%*	*-15%*	
Butter	13 040	19 736	18 596	19 707	51%	16 599	14 732	-25%
Growth rate	-	*51.3%*	*-5.8%*	*6.0%*	-	*-15.8%*	*-11%*	
Cheese and cottage cheese	13 033	14 952	17 042	17 154	32%	15 843	13 900	-19%
Growth rate	-	*14.7%*	*14.0%*	*0.7%*	-	*-7.6%*	*-12%*	

MDP	2004	2005	2006	2007	Increase 2004–2008	2008	2009	Decrease 2008– 2007
Yoghurt, and fermented milk and cream	78 618	86 944	100 902	107 299	36%	107 445	98 808	-8%
Growth rate	-	*10.6%*	*16.1%*	*6.3%*	-	*0.1%*	*-8%*	
Ice cream	9 853	12 246	12 965	13 748	40%	12 973	12 675	-8%
Growth rate	-	*24.3%*	*5.9%*	*6.0%*	-	*-5.6%*	*-2%*	
Total packaged MDPs[a]	1 000.0	1 250.0	1 400.0	1 500.0	50%	1 420.0	1 275.0	-15%

[a] *Own calculations.*
Source: Statistics Agency.

The market leaders are challenged to provide their farm suppliers with the best prices and conditions for collection, storage and transportation of whole milk. They are also seeking to diversify dairy product lines and promote new brands. More knowledge about consumer behaviour is required for estimating future domestic demand in terms of volume and quality. A key question is the extent to which increased incomes would translate into demand for larger volumes of MDPs rather than for MDPs of better quality and presentation.

Consumption of UHT milk is increasing rapidly and, according to Tetra Pack Central Asia estimates, will grow by one-third by 2012, to overtake the consumption of pasteurized milk. Most UHT milk is currently produced from reconstituted milk powder, of which 83 percent is imported. Most of the fresh milk produced by small PFs and HHFs cannot be processed for UHT production owing to these farms' failure to meet quality and safety requirements under current conditions. The demand for imported milk powder is therefore likely to grow, further constraining the demand for domestically produced fresh milk.

In addition, statistical MDP balance data indicate that there is a significant supply of unpackaged MDPs in Kazakhstan. Although the available official information (apart from a survey calculating per capita consumption at the household level)[14] does not confirm this, other uses are likely to include farmers' direct sales at bazaars and on streets, higher

14.- Conducted by the Statistics Agency in 2008 on a sample of 12 000 households.

consumption (human and for animal feed), and wastage well over what is currently assumed for calculation purposes.

Quality and safety standards

Leading dairy processing companies in Kazakhstan are aware that high-quality milk results in increased yields of value-added products, with longer shelf-life and improved organoleptic properties. However, small- and medium-scale dairies often cannot produce competitive dairy products owing to the expensive quality control systems for both raw materials and finished products. Small farms and HHFs cannot provide the required milk quality unless they are well organized and a cold chain system is in place.

European Union (EU) standards are based on Codex Alimentarius and World Organisation for Animal Health (OIE) recommendations. Concerns arise in three areas of safety: chemical safety, veterinary safety (phytosanitary safety for plants), and biosafety. Other concerns may also have an impact on trade, such as those regarding animal welfare, environmental aspects, employment conditions, and the quality of products in terms of constituents, appearance and taste. EU Directive 92/46/EEC on Milk and Milk Products is of particular importance for the dairy sector.

Kazakhstan is a member of the International Organization for Standardization (ISO). Technical policy for standardization is the responsibility of the Committee for Technical Regulation and Metrology (Kaz-Memst), which has a regular budget. Together with national ministries and departments, Kaz-Memst establishes technical committees to develop standards in different fields of industry, including environmental standards.

In Kazakhstan, milk quality is a major concern, and dairies only accept and pay for milk of acceptable quality. The main document for ensuring the safety of MDPs at all stages of the supply chain is the Technical Regulation on Requirements for the Safety of Milk and Dairy Products (No. 230 of 11 March 2008). Minimum quality standards are given in Table D.3. Raw milk should be filtered and cooled to between 2 and 4 °C within two hours

of milking, and can be stored by the producer for no more than 24 hours at 2 to 4 °C, including the time it takes to transport the milk for processing. During transportation and up until processing starts, the temperature of raw materials should not exceed 8 °C.

Table D.3: Quality standards for milk in Kazakhstan

Criteria	Grades		
	High grade	Grade I	Grade II
Smell and taste	Typical of milk, with no extraneous odours and flavours		
			Slightly sharp smell and flavour permitted in winter and spring
Acidity, °T	16–18	16–18	16–20
Cleanliness: not below group	I	I	II
Bacteria count, '000/sm^3	< 300	300–500	500–4 000
Somatic cell count, '000/sm^3	< 500	< 1 000	< 1 000
Including pathogenous Salmonella, g*	25	25	25
Density, kg/m^3		>1.027	
Antibiotics**	Not allowed		

Sources: * GOST 13264-88 Cow Milk; ** Sanitarian Regulations and Norms (No. 4.01.071.03).

The international standard for milk somatic cell count of 400 000 cells/ml for bulk milk is being adopted (since 1998) around the world as a result of the EU's requirements for international trade of milk and milk products. New Zealand, Australia, Switzerland and Norway all accept 400 000 cells/ml as the upper limit, and New Zealand may reduce this to 300 000 in the future, while the United States of America accepts 750 000 and Canada 500 000 cells/ml. It is important to note that high-quality milk with lower than 500 000 cells/ml is not available in Kazakhstan; dairy units consider grade I milk to be the best, and accept grade II, while grade III may be sold on streets and roadsides.

Sales and imports of MDPs must be accompanied by information about the products and documents certifying their safety (sanitary epidemiological results, veterinary and sanitary certificates, certificate of conformity). The certificate of conformity must be presented in accordance with Resolution No. 90 on the

Statement of Technical Regulation Conformity Assessment Procedures, based on the Law on Technical Regulation. The certificate is valid for the supply and sale of products within their shelf-life. Inspection typically includes a declaration of conformity, in which the manufacturer or retailer certifies that the product complies with requirements.

Regulations also require that all agents along the supply chain verify products' hygiene and safety, from inputs and raw materials up to packing materials, and including buildings and equipment. This means verifying that their supply system is part of a quality chain. For milk, such a chain involves not only the dairy farm but also the feed suppliers and veterinary practitioners serving the farm. In Europe, the main dairy processors have their own quality systems, such as QARANT for Friesland Foods, or they use EurepGAP. These systems incorporate the EU requirements for animal disease control, the safe use of drugs, the prevention and monitoring of residues, and provisions for animal welfare.

In Kazakhstan, many of the safety standards and norms that have been introduced by law are not put into effective practice. Central to this situation is the inadequate implementation of raw milk quality controls. Most of the milk delivered to collection points is of poor quality (with high levels of bacteria and somatic cells, and some presence of antibiotics). Only large- and medium-scale dairies undertake systematic checks, and select only milk of adequate quality for processing.

The new laws are based on the principle of prevention incorporated in the Hazard Analysis and Critical Control Point (HACCP) approach, but they have been applied in only a few dairies throughout Kazakhstan. In 2003, a workshop was held in Almaty to introduce the concept of HACCP in preparation for a training of trainers session in theoretical and practical aspects of HACCP as a risk management tool, organized by the World Health Organization (WHO)/Europe and the Kazakhstan School of Public Health, in collaboration with the Laboratory of Canton Ticino and the University of Sion (Switzerland) and FAO, within the food safety public health initiative for the Central Asian Republics.

Currently, the government supports agro-enterprises' adoption of HACCP and ISO standards through grants, which are provided via

tender and supported with funds from the World Bank project on the competitiveness of agricultural products. Table D.4 shows the numbers of dairy enterprises certified or in the process of certification.

Table D.4: Numbers of companies adopting international standards for livestock products and HACCP, 2009

Region	Total certified companies	Certified dairy enterprises	Companies in process of certification	Dairy enterprises in process of certification
Akmola	24	3	5	0
Aktobe	11	0	1	1
Almaty	31	6	3	0
Atyrau	9	1	4	2
East Kazakhstan	8	2	11	2
Jambyl	6	2	11	0
West Kazakhstan	24	4	4	2
Karaganda	30	5	2	1
Kostanay	24	3	7	0
Kyzylorda	3	1	0	0
Mangystau	6	3	2	0
Pavlodar	12	2	6	4
North Kazakhstan	14	1	3	1
Astana City	7	2	1	0
Almaty City	20	2	7	1
South Kazakhstan	19	4	1	0
Total	**248**		**68**	

Separate data on ISO and HACCP certification are not available.
Source: Kaz-Memst.

The majority of dairies limit their controls to checking the milk's dry matter and fat contents and level of acidity. As a result, quality control in Kazakhstan in inadequate, except for among those medium-scale milk processing plants that carry out routine analyses of raw milk and finished products. Street milk and milk products marketed in informal markets and bazaars are outside all formal control. Kazakhstan has no accredited laboratories and lacks control and regular inspections by public services. Inspections are carried out only on demand or when a problem is suspected. Only dairies are subject to inspections and penalties.

Raw milk quality is a serious problem and represents a considerable obstacle for the development of dairy processing in Kazakhstan. Modern dairies cannot obtain sufficient raw milk of adequate quality for their processing operations, while lower-quality milk continues to find buyers. To ensure an adequate supply of milk for their operations, dairies have to collect it from locations that are hundreds of kilometres away and from large numbers of scattered small producers. This requires improvements to the cold chain. The currently poor system of milk production and collection increases the costs of raw milk for processors, thereby increasing the costs of dairy products. High prices for consumers contribute to the survival of an informal, unregulated sector.

It should be noted that in the short and medium terms, HHFs and small farms with inadequate milk quality are likely to make up a large share of milk producers in Kazakhstan. Guaranteeing the production of safe milk for domestic consumption is of paramount importance. Regarding future opportunities for Kazakhstan in the international trade of dairy products, the government should support farmers in increasing their awareness of and compliance with international requirements and standards. Improved processes and technologies will make it easier for the milk industry to meet requirements for quality milk with a reasonable shelf-life.

E
SUPPLY CHAIN ANALYSIS

The supply chains for different dairy products include a range of links between the consumer and the farm: procurement, transportation, processing, commodity storage, conversion packaging, distribution, retailing, and food services. The processing link can be broken into fluid products, manufactured products, by-products, and balancing. As well as the main actors in the dairy supply chain, a number of supporting organizations are also involved. Analysis included examination of case studies based on data collected during a field survey in four regions, with at least one leading farm being interviewed per region. The regions selected were Akmola, Almaty, East Kazakhstan and North Kazakhstan because of their large cow populations, quantities of milk produced and large urban areas with consumers, such as Almaty and Astana cities.

Case studies on production levels

Table E.1 presents the five categories of farm present in Kazakhstan, with a breakdown of the costs of production for 1 kg of milk, including assessment of the financial risk and competitiveness. The value chain analysis included data on:

- the region and distance from developed urban areas;
- size and status of the farm;
- size of herd and cow yield;
- type of animals and type of feed;
- quality of milk produced;
- cost of 1 kg of milk (3.2 percent fat content);
- subsidies and other support received, and their effectiveness;
- milk utilization along the chain;
- farm financial performance.

Comparison of the milk production cost for different milk producers with the average of T 36/kg found that: i) the cheapest milk production among registered farms was for medium-scale farms, at T 26.3/kg in East Kazakhstan and T 29.4/kg in Akmola; ii) the highest production cost was T 51.7/kg for the MDF in Akmola; and iii) the HHF achieved the lowest costs, at T 25/kg, but this did not include labour costs and the HHF surveyed does not apply good practice in cattle keeping and health control, as registered entities do.

Table E.1: Cost analysis of milk production (T/kg)

Farm type	MDFs 500–2 000 cows	Large-scale 500–2 000 cows			Medium-scale 100–500 cows		Small < 100 cows	HHFs 1–5 cows	
Case study	**MDF in Akmola oblast**	**AE in Almaty oblast**	**AE in East Kazakhstan oblast**	**AE in North Kazakhstan oblast**	**PF in East Kazakhstan oblast**	**PF in Akmola oblast**	**HH in Almaty oblast**	**Total**	**To sell**
Number of cows	1 040	993	550	600	170	220	38	2	
Yield per cow, kg/ year	5 800	5 640	4 670	3 000	3 609	3 200	3 200	2 250	
Volume of milk produced, tonnes (2008)	6 032	5 601	2 569	1 800	614	704	122	3 000	4 500
Costs									
Variable costs									
Feed inputs	17.4	14.5	18.1	21.5	8.4	11.2	19.7	19.0	19
Fuel, electricity, water, etc.	2.0	1.9	2.5	2.1	4.0	2.9	7.4		
Spare parts, maintenance	2.2	0.5	0.8	0.6	0.4	2.5			
Veterinarian inputs	3.4	2.8	1.2	0.9	0.2	0.2	0.8		
Labour	5.4	5.1	13.3	9.8	8.8	10.9	14.3		
Administration	1.2	0.9	2.2	1.8					
Other inputs			3.1	2.1	0.8		2.3	6.0	6.0
Subtotal costs	**31.6**	**25.7**	**41.2**	**38.8**	**22.5**	**27.7**	**44.6**	**25.0**	**25.0**
Overheads									
Depreciation	11.4	8.6	3.0	1.3	3.2	1.2			

Farm type	MDFs 500–2 000 cows	Large-scale 500–2 000 cows			Medium-scale 100–500 cows		Small < 100 cows	HHFs 1–5 cows	
Case study	MDF in Akmola oblast	AE in Almaty oblast	AE in East Kazakhstan oblast	AE in North Kazakhstan oblast	PF in East Kazakhstan oblast	PF in Akmola oblast	HH in Almaty oblast	Total	To sell
Taxes	1.2	1.4	0.8	0.9	0.6	0.5	0.6		
Leasing charges	7.5	4.3							
Total production costs	**51.7**	**40.0**	**45.0**	**41.0**	**26.3**	**29.4**	**45.2**	**25.0**	
Milk price ex-farm (including 12% VAT)	**60.0**	**60.0**	**50.0**	**50.0**	**49.0**	**60.0**	**90.0**	**30.0**	
VAT (12%)	6.4	6.4	5.4	5.4		6.4			0.0
Gross profit/loss	**1.9**	**13.6**	**-0.4**	**3.6**	**22.7**	**24.2**	**44.8**	**5.0**	**0.0**
Tax on profit	0.4	2.7		0.7		4.8			0.0
Public support									
Subsidies	20	11.0	11.0	11.0	11.0	11.0			
Tax relief on VAT	4.5	4.5	3.8	3.8	0.0	4.5	0.0	0.0	0.0
Tax relief on profit	0.3	1.9		0.5	0.0	3.4	0.0		0.0
Total public support	**24.8**	**17.4**	**14.8**	**15.3**	**11.0**	**18.9**	**0.0**	**0.0**	**0.0**
Net profit/loss	**26.3**	**28.3**	**14.4**	**18.2**	**33.7**	**38.2**	**44.8**	**5.0**	**0.0**
Price margin	37.7	36.9	17.4	19.5	36.9	39.4	44.8	5.0	0.0
Profitability, % with subsidy	**50.8**	**70.6**	**32.0**	**44.3**	**128.1**	**130.0**	**110.3**	**20.0**	
Profitability, % without subsidy	**12.1**	**43.1**	**7.5**	**17.5**	**86.3**	**92.6**	**99.2**	**20.0**	

Source: Own calculations and estimations based on case studies and secondary data.

An unregistered small/family farm in Almaty showed a high milk production cost of T 45.2/kg, which is close to that for large-scale farms. This was because this farm is in a transition stage, seeking to improve animal health and productivity through better feeding and higher-quality breeds. Eventually, the production cost should decline. The cost of labour is usually lower in small farms, many other costs are not counted, and taxes are lower than for registered entities (or small farms are tax-exempt).

The profit and loss accounts of different-sized producers can vary a lot. The highest profits for registered farms were still with the medium-scale farms, at T 38.2/kg in Akmola and T 33.2/kg in East Kazakhstan. The main cause of these high profits is the wholesale price paid by retailers and, ultimately, the final price paid by consumers in Kazakhstan's capital city.

The MDF's profit of T 23.6/kg is mainly due to the subsidy of T 20/kg. This MDF does not have its own dairy unit, which would increase its profit at the next stage of the added value chain.

The highest profit was for an unregistered small/family family, with T 44.8/kg, which resulted from direct sales of milk and the higher prices obtained in the large urban area of Almaty City for a niche product. This figure is exceptional; in spite of the high production costs for this farm, it can make profits of about 100 percent by selling directly to the market. The main bias against small farms is that they cannot obtain such high prices by selling their milk wholesale for processing. However, small farms are likely to survive if they continue to offer a high-quality niche product.

The lowest profit, of T 5/kg was calculated for a HHF. However, HHFs can still make money by selling their surplus milk production to dairy manufacturers, as long as it is good-quality milk with high nutrient value, produced under hygienic conditions. HHFs located close to urban areas can obtain higher profits by selling milk directly at bazaars and on streets. This milk is subject to very little control regarding health risks, but consumers continue to buy it owing to its competitive price in comparison with packaged milk from retailers, and the low income of much of the rural population.

This analysis does not give the whole picture of a farm's performance because it is based on the production cost and the profit and loss account for milk only. As well as milk production, a farm may also carry out other businesses, which will bring it additional profits or losses. The profitability per kilogram of milk produced was again highest for the medium-scale farms, at 130 percent in Akmola and 128.1 percent in East Kazakhstan. The large-scale farms showed a good financial performance of 70.6 percent in Almaty, but a considerably lower 32 percent in East Kazakhstan, and 44.3 percent in North Kazakhstan.

The MDF achieved profitability of 50.8 percent, but MDFs and large AEs improve their profitability through the subsidies they receive on all the milk they sell. Breeding farms, most of which are MDFs and large farms with a few medium-scale farms, receive T 11/kg of milk sold, while other dairy farms receive T 8/kg. This subsidy is to reduce feeding costs. Subsidies do not decrease the price of raw milk, but do improve the profitability of farms.

Profitability in the dairy sector is largely driven by national and international markets. Feeding is the largest milk production cost. Optimizing feed management is therefore a profitable investment that can improve herd reproduction and health while reducing environmental impact. Some systems and products can improve feeding efficiency and animal performance, regardless of the feeding strategy or farm layout. Feed quality can be improved by using the correct feed additives.

Most large farms in Kazakhstan process milk themselves to help subsidize the high costs of milk production. These farms try to find market niches for their dairy products, but they cannot be competitive in the long term unless they offer high-quality niche products. In some regions such as Atyrau or Mangystau, where milk production is extremely low, this type of farm can supply the market with pasteurized milk and flavoured milk products with short shelf-life. Medium-scale farms cooperate with processing units, which procure the farms' raw milk for processing. Some small farmers work through intermediaries to sell their milk to dairy plants. The last two years have seen significant rises in the prices of inputs for the dairy farm sector and the wider agricultural industry. However, the results

of the analysis suggest that the increase in the producer price for milk has helped increase dairy farms' profitability.

Profitability in the dairy farm sector is variable, however. It can generally be expected that smaller dairy enterprises with low milk yields per cow will have higher production costs and will therefore struggle to make profits. According to the analysis of milk producers, medium-scale farms have higher profits and face less competition. Given that the producer price for milk and the prices for inputs such as fertilizer, feed and fuel are to a large extent determined on global markets, so cannot be influenced by developments in Kazakhstan, the dairy farm sector should be encouraged to restructure to improve its cost structure.

Intermediary level

The dairy supply chain starts with milk producers and continues with milk processors. Between these two, come the intermediaries, who can operate under contract with a dairy or as individual entrepreneurs. Intermediaries/small traders usually collect milk from HHFs and sell it to a dairy or receive a small monthly rate plus commission, which depends on the quality and quantity of the milk collected and delivered to the dairy. Some intermediaries have exclusive agreements to deliver all the milk they collect to one dairy manufacturer; others may sell predominantly to one manufacturing buyer and to others when their prices are more attractive, especially in winter. The breakdown of costs for milk collection and transportation and the types of intermediary involved are presented in Annex 2.

Annex 2 shows that the margins for intermediaries average T 2.3/kg of milk collected for small traders to T 7.3 for milk collection centres. HHFs achieve higher margins and profits if they transport the milk themselves for sale at bazaars or on the streets of nearby urban areas. Where this margin is not shown it means that the milk producer processes the milk at her/his own small-scale dairy unit.

The costs for storage are not included in the final costs. The Government of Kazakhstan provides no subsidies to this stage of the chain, which also

lacks private initiatives in rural areas, owing to the high initial investments that small entrepreneurs need to make. Only dairy units or farms with their own chilling tanks and chilling trucks can afford to establish cold chains from milk producer to processor. At present, most of this equipment is obsolete and has depreciated twice. There is great need to update cold storage and transport equipment, and to install new milk collection centres close to milk producers throughout the country. This will lead to immediate improvements in milk quality, and will reduce the costs of collecting milk for dairy processors. It will also have a positive social impact by increasing the incomes of rural people through sales of surplus milk.

Processor level

The dairy plants visited fell into four categories: small, medium, large, and large with a vertically integrated system. The analysis used data on:

- region, and distance from developed urban areas;
- size and status of dairy;
- organizational structure and contractual arrangements;
- capacity and capacity utilization;
- type of dairy product produced;
- marketing;
- cost of producing 1 kg of pasteurized milk with 3.2 percent fat content;
- subsidies or other support, and their effectiveness;
- milk utilization along the chain;
- financial performance.

Table E.2 presents a breakdown of the costs of processing 1 kg of milk and converting it into pasteurized packaged milk with 3.2 percent fat content. An example of UHT milk costs is also presented.

Table E.2: Cost analysis of milk processing (T/kg)

	Akmola	North Kazakhstan	Almaty	Akmola	North Kazakhstan	East Kazakhstan	Almaty
	Farm with small dairy plant	Farm with small dairy plant	Farm with medium-scale dairy plant	Medium-scale dairy plant	Large-scale dairy plant	Large-scale dairy plant	Dairy corporation
Capacity	**< 10 tonnes**	**< 10 tonnes**	**10–30 tonnes**	**10–30 tonnes**	**> 30 tonnes**	**> 30 tonnes**	**> 2 dairy plants**
Loading capacity, tonnes/shift	5	5	15	10	30	40	170
Milk processed, tonnes (2008)	5 250	1 570	2 525	1 800	9 400	15 440	48 280
Variable							
Milk price from AE					50.0	49.0	50.0
Milk price from PF			60.0	29.4	50.0	50.0	0.0
Milk price from HH			51.7	51.7	51.7	51.7	51.7
Milk price from small trader					40.0	40.0	40.0
Average milk price	51.7	41.0	53.0	36.2	47.0	42.0	44.0
Processing	1.1	2.4	6.3	5.2	6.4	7.4	5.6
Power	0.4	0.6	3.2	1.9	3.9	4.2	3.4
Labour	1.0	2.3	4.5	3.2	4.2	4.3	3.3
Packing materials	2.6	5.0	8.0	4.8	7.6	7.3	25.0
Certification	0.1	0.1	0.5	0.2	0.2	0.6	0.1
Miscellaneous expenses	0.1	0.1	2.0	1.4	0.4	0.2	1.8
Marketing	2.0	1.0	3.0	3.0	5.8	12.2	10.9
Administration	0.1	0.2	4.2	2.7	2.6	2.0	4.6
Subtotal costs	**59.1**	**52.7**	**84.7**	**58.6**	**78.1**	**80.2**	**98.7**
Overheads							
Loan charges	0.0	0.4	0.4	0.0	0.0	4.8	4.7
Leasing charges	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Depreciation	0.4	0.8	0.8	0.3	1.7	2.1	2.7
Taxation	0.0	3.5	3.5	3.4	1.8	2.4	4.2

	Akmola	North Kazakhstan	Almaty	Akmola	North Kazakhstan	East Kazakhstan	Almaty
	Farm with small dairy plant	Farm with small dairy plant	Farm with medium-scale dairy plant	Medium-scale dairy plant	Large-scale dairy plant	Large-scale dairy plant	Dairy corporation
Capacity	< 10 tonnes	< 10 tonnes	10–30 tonnes	10–30 tonnes	> 30 tonnes	> 30 tonnes	> 2 dairy plants
Processing costs	**59.5**	**57.4**	**89.4**	**62.3**	**81.6**	**89.5**	**110.3**
Wholesale pasteurized milk price ex-plant	85.0	90.0	102.0	90.0	98.0	105.0	118.0
VAT (12%)	9.1	9.6	10.9	9.6	10.5	11.3	12.6
Gross profit/loss	16.4	23.0	1.7	18.1	5.9	4.3	-4.9
Taxes on profit	3.3	4.6	0.3	3.6	1.2	0.9	-1.0
Government support							
Reduced interest rates	0.0	0.1	0.1	0.0			2.8
Tax relief	6.4	6.8	7.7	6.8	7.4	7.9	8.9
Subsidies	0.0	0.0	0.0	0.0			
Total government support	**6.4**	**6.9**	**7.8**	**6.8**	**7.4**	**7.9**	**11.7**
Net profit/loss	19.5	25.2	9.1	21.2	12.1	11.3	7.7
Performance							
Price margin	19.9	26.0	9.9	21.5	13.8	13.4	10.4
Profitability	33.0	47.8	10.7	36.2	15.5	14.1	7.8
Competitiveness	Moderate, niche product	Low	High	Moderate	Moderate	Moderate	Moderate
Risk assessment	High: credit and leasing	Moderate	High	Moderate	Moderate	Moderate	Moderate
Notes	Sells wholesale and retail; vertical supply chain of farm–processing–wholesale–retail	Sells retail; vertical supply chain of farm–processing–retail	Sells wholesale and retail; processes milk collected from farms and HHFs	Sells retail; vertical supply chain of farm/ HHF–processing–retail	Sells wholesale and retail; processes milk from farms and milk collection centres	Sells wholesale and retail; processes milk from farms and milk collection centres	Sells UHT milk wholesale and retail; milk from dairy farms and milk collection centres

Source: Own calculations and estimates based on case studies and secondary data.

The processing cost for 1 kg of pasteurized milk varies from T 57.4 for a farm with its own small dairy unit in North Kazakhstan, to T 89.5 for a large dairy in East Kazakhstan; T 68.2/kg is the national average. The cost of processing UHT milk is T 110.3/kg at a large-scale dairy (corporation) in Almaty. Table E.2 shows that the variable cost is that for raw milk, which accounts for between 58 and 93 percent of total costs. This is only a rough calculation of the costs, profits and losses involved in producing pasteurized milk because it does not include the cost of skimming fat.

Although this cost analysis suggests that large dairy farms (with processing) make a profit on average, there is variation among farms across the country. The cost calculations clearly show that the main problem, especially for large dairies, is the low utilization rate, which is only about 50 percent of capacity. Dairies producing UHT milk can obtain milk supplies of the required quantity and quality by importing skimmed milk powder (mainly from Belarus).

The lowest processing costs are achieved by medium-scale dairies, owing to their higher capacity utilization rate. However, marketing is costly for small- and medium-scale dairies. It can be concluded that reducing production costs for dairies will require increasing the supply, reducing the price and increasing the quality of domestically produced raw milk so that it can compete with imported dairy products.

Dairies also need support from farm cooperatives for organizing milk collection in remote areas, where the cost of milk is lower and there are fewer buyers than in areas close to large cities. Operating costs for producing pasteurized milk appear not to vary much among regions; differences in the final cost of packaged milk reflect differences in the wholesale price for raw milk. This factor becomes essential for the production of cheese, milk powder and butter. By processing milk at their own dairy units, MDFs can gain more profits per kilogram of the milk they produce, thereby improving overall profitability along the value chain.

Medium-scale dairies are now considered the most competitive and profitable, but this situation may not last for long, as large-scale dairies become more competitive in the market, through their use of imported products, buying and selling of dairy products across the whole country,

and potential for increasing exports of Kazakh dairy products. Small- and medium-scale dairies cannot afford such wide national and international coverage, but they will always have niche markets for a range of short-shelf-life dairy products close to urban areas. Another option for small- and medium-scale dairies is to expand into remote areas, where raw milk and labour are cheaper, and produce long-shelf-life products (e.g., cheese, milk powder, condensed milk) sold under one umbrella of several small- and medium-scale dairies. These dairies could also sell their products to large dairy corporations, in which case bargaining power over prices will be extremely important.

F
DEVELOPMENT OUTLINES

This section outlines specific issues of the dairy sub-sector and its opportunities for development. In general, however, all areas would benefit from a reorientation of current government support schemes. Public support should focus on restructuring and broadening the current economically significant subsidization programme. This could include subsidizing the interest payments on credit and issuing guarantee funds and rebate schemes for lending programmes. The sector-related risk assessment capacity of participating financing institutions could also be supported. Otherwise, direct investments should be directed to public goods areas (e.g., rangeland rehabilitation), human resources development, and the provision of technology and essential services (e.g., veterinary). An impact analysis of the current government subsidy programme should be carried out.

A considerable fresh milk surplus from small-scale farms is not being absorbed by processors. This is mainly because milk is not cooled immediately after milking and, in the absence of adequate supply channels, it deteriorates rapidly, worsening the already low quality of a product milked under inappropriate hygiene conditions. Processors face a deficit of nationally produced quality fresh milk. This situation could be addressed through the processor-led development of cold chain supply channels, including cooling tanks for small-scale dairy farms, timely transportation in chilling tankers, improved milk collection, quality management, and the introduction of premium prices based on the quality of the milk. The development of cold chains would require investments in quality and safety control protocols and systems, laboratory equipment, and staff training. Economy of scale factors should be taken into account, and priority given to areas and farms – both small-scale and PFs – in locations that are convenient for processing units. Investments should be pursued in close cooperation with dairy farmers at all levels, including small-scale and

PFs, but operations must be supported by milk processors. International experience shows that investment interventions centred on small-scale farmers tend to fail, and have low profitability and high transaction costs. There is evidence that processor-led approaches have higher chances of success, as processors are better placed to determine the correct scale for interventions, which is linked to the size of the ensured market that the processors control.

Ongoing public investments in MDFs are not showing evidence of financial sustainability, owing to apparently excessive capital investments and inadequate project design. This generally leads to very low profitability, dependency on subsidies, and very long repayment periods. A number of PFs keeping 30 to 100 or more cows each appear to be managing profitable and sustainable businesses, but most need support for the renewal of stock sheds, upgrading of milking units, fodder storage, maintenance of equipment, etc. They also need technical assistance on dairy farming, ration formulation, veterinary management, milking techniques, milk cooling and storage, artificial insemination, marketing, etc. For these farmers, a demand-driven investment programme should be designed, including the supply of appropriate equipment and technical assistance.

The feed rations of milking cows in most small-scale farms are inadequate and overloaded with rough feeds. This leads to high production costs, low productivity and health issues. The use of milk-enhancing feed such as green fodder and silage is very low, owing to lack of supply and knowledge. Demonstration programmes for milk farms and forage production units are recommended, and technical assistance activities should be planned.

Further studies are required on production levels in HHFs. These should investigate the actual own consumption and supply levels for unpackaged MDPs in such farms, with the aim of understanding the potential for enhancing PFs and HHFs so that they can develop into dairy business units/farms. Feasibility studies on the opportunities for diversifying processing activities are required, particularly regarding the feasibility and potential profitability of domestic milk powder production. These studies should also investigate technological modalities and organizational options for increasing the production of UHT milk from domestic supplies.

Hence, the potentially viable investment options for the dairy sector highlighted by this analysis include the following:

(a) Prioritizing processor-led development of cold chain supply channels (off-farm), including cooling tanks for small-scale dairy farms, timely transportation in chilling tankers, improved milk collection, quality management, and the introduction of premium prices based on the quality of the milk. The development of cold chains would also require investments in quality and safety control protocols and systems, laboratory equipment, and staff training with specialized technical assistance.

(b) In parallel, providing support to small-scale producers and PFs (on-farm), by identifying and selecting those that can manage profitable and sustainable businesses. This would include support for renewal of stock sheds, upgrading of milking units, fodder storage, maintenance of equipment, etc. These categories also need specialized technical assistance on dairy farming, ration formulation, veterinary management, milking techniques, milk cooling and storage, artificial insemination, marketing, etc.

(c) Supporting enhanced and improved fodder and silage production through demonstration programmes for milk farms and forage production units, with technical assistance on the use of milk-enhancing feed, green fodder and silage.

(d) Conducting specific studies on: i) the potential for enhancing PFs and HHFs that can develop into dairy business units/farms; ii) the MDP market and domestic demand analysis (trends/consumer behaviours); and iii) the feasibility and potential profitability of domestic milk powder production and of technological modalities and organizational options for increasing the production of UHT milk from domestic supplies.

ANNEX 1: REFERENCE TABLES

Highlights on four livestock sub-sectors in Kazakhstan

Table 1: Cattle and cows inventory, 1 January 1 (thousand head)

	1960	1980	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cattle	5 543	8 693	9 757	9 592	9 576	9 347	8 073	6 860	5 425	4 307	3 958
Cows	2 042	2 985	3 368	3 490	3 623	3 687	3 397	3 045	2 547	2 110	1 953
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Cattle	3 998	4 107	4 294	4 560	4 871	4 871	5 204	5 457	5 660	5 841	5 992
Cows	1 962	2 015	2 077	2 171	2 267	2 376	2 449	2 569	2 600	2 606	2 675

Table 2: Cattle inventory of agricultural enterprises, 2008

	Total AEs with cattle	Total cattle	Incuding															
			Up to 10 head				10 to 50 head				50 to 100 heads				100 head and more			
			No. of AEs	% of AEs	No. of cattle	% of cattle	No. of AEs	% of AEs	No. of cattle	% of cattle	No. of AEs	% of AEs	No. of cattle	% of cattle	No. of AEs	% of AEs	No. of cattle	% of cattle
Kazakhstan	849	321 200	74	8.7%	321	0.1%	221	26.0%	5 782	1.8%	103	12.1%	7 388	2.3%	452	53.2%	307 710	95.8%
Akmola	137	44 000	4	2.9%	-	0.0%	39	28 5%	1 056	2.4%	15	10.9%	1 056	2.4%	79	57.7%	41 888	95.2%
Aktobe	80	13 600	8	10.0%	41	0.3%	30	37 5%	775	5.7%	9	11.3%	653	4.8%	33	41.2%	12 131	89.2%
Almaty oblast	111	29 500	11	9.9%	59	0.2%	30	27.0%	856	2 9%	16	14.4%	1 180	4.0%	54	48.7%	27 406	92.9%
Atyrau	19	2 700	4	21.1%	16	0.6%	8	42.1%	235	8.7%	2	10.5%	143	5.3%	5	26.3%	2 306	85.4%
West Kazakhstan	50	10 900	4	8.0%	11	0.1%	15	30.0%	414	3.8%	8	16.0%	589	5.4%	23	46.0%	9 886	90.7%
Zhambyl	33	5 700	6	18.2%	23	0.4%	12	36.4%	331	5.8%	4	12.1%	268	4.7%	11	33.3%	5 079	89.1%
Karaganda	42	7 500	7	16.7%	30	0.4%	16	38.1%	405	5.4%	2	4.8%	158	2.1%	17	40.4%	6 908	92.1%
Kostanai	95	87 500	4	4.2%	-	0.0%	9	9.5%	263	0 3%	3	3 2%	175	0.2%	79	83.1%	87 063	99.5%
Kyzylorda	18	2 300	2	11.1%	14	0.6%	3	16.7%	71	3.1%	6	33 3%	449	19.5%	7	38.9%	1 766	76.8%
Mangistau	1			-		-	1	100.0%	-	100.0%		-		-		-		-
South Kazakhstan	87	8 100	9	10.3%	49	0.6%	34	39.2%	842	10.4%	15	17 2%	915	11.3%	29	33.3%	6 294	77.7%
Pavlodar	57	33 200	1	1.8%	-	0.0%	8	14.0%	299	0 9%	9	15.8%	697	2.1%	39	68.4%	32 204	97.0%
North Kazakhstan	65	41 800	8	12.3%	42	0.1%	7	10.8%	209	0 5%	9	13.8%	711	1.7%	41	63.1%	40 839	97.7%
East Kazakhstan	51	32 900	6	11.8%	33	0.1%	9	17.6%	165	0 5%	4	7.8%	263	0.8%	32	62.8%	32 439	98.6%
Astana city	1	700		-		-		-		-		-		-	1	100.0%	700	100.0%
Almaty city	2	800		-		-		-		-	1	50.0%	69	8.6%	1	50.0%	731	91.4%

Table 3: Cattle inventory of peasant farms, 2008

	Total PFs with cattle	Total cattle, '000 head	Incuding															
			Up to 10 head				10 to 50 head				50 to 100 head				100 head and more			
			No. of PFs	% of PFs	'000 cattle	% of cattle	No. of PFs	% of PFs	'000 cattle	% of cattle	No. of PFs	% of PFs	'000 cattle	% of cattle	No. of PFs	% of PFs	'000 cattle	% of cattle
Kazakhstan	16 155	734.8	3 312	20 5%	17.6	2.4%	8 691	53.8%	208.7	28.4%	2 585	16.0%	176.4	24.0%	1 567	9.7%	332.1	45.2%
Akmola	83	8.0	3	3.6%	0.0	0.2%	33	39.8%	0.8	9.9%	21	25 3%	1 5	18 2%	26	31.3%	5.7	71.7%
Aktobe	754	33.7	151	20.0%	0.8	2.3%	405	53.7%	10.3	30.6%	116	15.4%	7.6	22.6%	82	10.9%	15.0	44.5%
Almaty oblast	4 116	202.1	576	14.0%	3.2	1.6%	2 239	54.4%	56.4	27 9%	831	20 2%	56.8	28.1%	469	11.4%	85.9	42.5%
Atyrau	1 168	26 5	391	33.5%	2.0	7.6%	653	55.9%	13.8	52.0%	99	8 5%	6.6	25.0%	25	2.1%	4.1	15.4%
West Kazakhstan	1 449	76.0	326	22.5%	1.7	2.2%	717	49.5%	16 9	22 3%	219	15.1%	15.3	20.1%	187	12.9%	42.1	55.4%
Zhambyl	1 148	34 5	309	26.9%	1.6	4.7%	672	58.5%	15 2	44.0%	123	10.7%	8.4	24.4%	45	3.9%	9.3	26.9%
Karaganda	2 311	82 9	580	25.1%	3.1	3.7%	1 262	54.6%	28 5	34.4%	305	13 2%	20.6	24.8%	164	7.1%	30.8	37.1%
Kostanai	136	11.9	4	2.9%	0.0	0.2%	62	45.6%	1.7	14 2%	36	26.5%	2.5	21.4%	34	25.0%	7.6	64 2%
Kyzylorda	378	13.3	98	25.9%	0.5	3.5%	204	54.0%	4 9	37.0%	44	11.6%	3.0	22.8%	32	8.5%	4 9	36.7%
Mangistau	240	2.2	159	66.3%	0.8	35.2%	79	32 9%	1 3	60.1%	2	0.8%	0.1	4.7%	-		-	
South Kazakhstan	769	27.4	249	32.4%	1.2	4.5%	358	46.6%	8.0	29.1%	106	13.8%	7.3	26.6%	55	7.2%	10 9	39.8%
Pavlodar	712	54.9	51	7.2%	0.3	0.6%	349	49.0%	9.6	17.4%	172	24.1%	12.0	21.9%	140	19.7%	33.0	60.1%
North Kazakhstan	58	7.5	4	6.9%	0.0	0.3%	21	36 2%	0 5	7.1%	14	24.1%	1.0	12.9%	19	32.8%	6.0	79.7%
East Kazakhstan	2 831	153.9	408	14.4%	2.3	1.5%	1 633	57.7%	40.6	26.4%	498	17.6%	33.6	21.8%	292	10 3%	77.4	50 3%
Astana city	1			-		-	1	100.0%		100.0%		-					-	
Almaty city	1		1	100.0%		100.0%		-		-		-	-				-	

Table 4: Numbers of cattle and cows in AEs, PFs and HHFs (million head)

Cattle																			
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
AEs	6.7	6.4	6.1	5.5	4.4	3.2	1.9	0 9	0.5	0.4	0 3	0.3	0.3	0 3	0.3	0.3	0 3	0.3	0.3
PFs	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0 2	0.2	0.2	0 2	0.2	0.3	0 3	0.4	0.5	0.6	0.6	0.7
HHFs	3.0	3 2	3.5	3.8	3.6	3.5	3.3	3.1	3.2	3.4	3.6	3.7	3.9	4 2	4.4	4.7	4.8	4 9	4.9
Cows																			
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
AEs	1.8	1.8	1.7	1.6	1.4	1.1	0.7	0.3	0 2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PFs	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0 2	0.2	0.2	0 3	0.3
HHFs	1.6	1.7	1 9	2.0	2.0	1 9	1.8	1.7	1.7	1.7	1.8	1 9	1.9	2.0	2.1	2.1	2.2	2 3	2.3

Table 5: Capacity utilization of milk processing enterprises

Region	Production*	including processing	Processing share, %	Capacity, tonnes/year	Capacity utilization, %	Standby capacity, %
Akmola	399 912	31 351	7.8%	137 715	22.8%	77.2%
Aktube	266 637	59 416	22 3%	84 940	70.0%	30.0%
Almaty	586 903	187 696	32.0%	234 046	80 2%	19.8%
Atyrau	46 637	7 733	16.6%	19 220	40 2%	59.8%
East-Kazakhstan	600 177	82 122	13.7%	106 006	77 5%	22.5%
Jambyl	233 982	64 139	27.4%	99 000	64.8%	35.2%
West-Kazakhstan	204 690	19 001	9 3%	32 693	58.1%	41.9%
Karaganda	291 239	86 970	29 9%	89 422	97 3%	2.7%
Kostanay	554 071	161 587	29 2%	178 628	90 5%	9.5%
Kyzylorda	63 186	3 530	5.6%	8 939	39 5%	60.5%
Mangystau	3 097	24 485	790 5%	8 680	100.0%	0.0%
Pavlodar	299 292	87 600	29 3%	158 100	55.4%	44.6%
North-Kazakhstan	485 487	129 422	26.7%	213 217	60.7%	39.3%
South-Kazakhstan	528 584	63 606	12.0%	120 000	53.0%	47.0%
Astana city	1 770	78 472	4433.7%	55 800	100.0%	0.0%
Almaty city	4 248	332 686	7832.0%	478 447	69 5%	30.5%
Kazakhstan	**4 569 912**	**1 419 816**	**31.1%**	**2 024 853**	**70.1%**	**29.9%**

* *Excluding calf feeding (13 percent of total production volume).*

Table 6: Milk production, by farm category, 1990 to 2008 (million tonnes)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
AEs	3.1	2 9	2.4	2.3	1 9	1.3	0.8	0.4	0.3	0.2	0 2	0.2	0.2	0 2	0.2	0.2	0 2	0.2	0.2
PFs	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0 2	0.2	0.2	0 2	0.2	0.2	0 2	0.2	0.3	0 3	0 3	0.3
HHFs	2.6	2.7	2.9	3.2	3.4	3.2	2.8	2.7	2.9	3.1	3.4	3.6	3.8	3 9	4 2	4.3	4 5	4.6	4.7

Table 7: Farm-gate prices of fresh milk, 2001 to 2009, at end of year (Tenge per kilogram)

	2001	2002	2003	2004	2005	2006	2007	2008
Kazakhstan	21.2	20.7	22.4	23.9	26.8	29.4	35.8	46 2
Akmola	18.0	17.2	19.8	21.3	22.1	24.8	34.1	41 2
Aktobe	25.4	28.6	31.9	36.9	37.7	36.1	44.7	49.4
Almaty oblast	21.7	22.3	23.9	24.5	26.7	31.3	33.4	48.7
Atyrau	28.0	43.6	36.2	44.9	50.8	55.8	56.4	64.6
West Kazakhstan	27.4	30.4	31.2	30.4	29.4	32.1	45.0	58.0
Zhambyl	21.3	19.4	22.6	24.9	29.2	30.2	42.1	48.4
Karaganda	22.5	21.8	27.2	25.5	30.4	38.6	45.7	61.8
Kostanai	18.8	19.1	22.0	23.7	27.8	31.5	38.4	46.5
Kyzylorda	28.0	29.9	26.9	30.4	30.0	32.0	39.5	47.3
Mangistau	94.6	105.7	98.0	98.0	102.5	104.9	106.4	111.5
South Kazakhstan	18.2	19.1	19.3	22.0	25.3	25.3	29.2	44.0
Pavlodar	19.9	19.0	20.7	24.7	27.1	31.7	32.6	40.5
North Kazakhstan	20.6	18.9	21.8	21.6	25.1	24.6	30.2	44.1
East Kazakhstan	19.7	20.5	21.6	25.9	29.8	28.3	37.0	51.6

Prices represent the average farm-gate prices of AEs and PFs.

Table 8: Average production costs of milk in agricultural enterprises, 2004 to 2008 (thousand tenge)

	Total costs	Including										Cost of milk, T/kg
		Inputs	Including						Salaries	Depreciation of fixed assets	Other costs	
			Feed	Fuel	Electricity	Water	Spare parts, etc.	Services				
2004	3 420 045	1 918 928	1 402 354	148 110	145 595	33 439	150 143	39 287	833 035	95 723	572 359	19.43
2005	3 994 088	2 299 592	1 609 280	212 070	153 835	40 583	211 089	72 735	986 609	128 038	579 849	22.65
2006	4 259 105	2 443 491	1 789 270	206 338	152 523	33 783	200 453	61 125	1 045 390	167 359	602 864	23 34
2007	4 810 762	2 653 431	1 778 438	264 062	191 177	34 214	309 325	76 216	1 210 767	138 669	807 895	27 22
2008	6 002 912	3 183 161	2 183 181	352 499	222 057	42 855	318 446	64 123	1 373 861	305 524	1 140 366	35 51

Table 9: Numbers of breeding cattle in all categories of farms, I January 2009 (thousand head)

Region	Total cattle	Including cows	Dairy cattle	Dual-purpose cattle		
			Cattle total	Cows	Cattle total	Cows
Akmola	26 133	8 727	13 391	4 865		
Aktobe	4 923	2 238	2 842	1 422		
Almaty	93 951	46 161	13 474	5 726	58 743	29 383
Atyrau	2 071	821	1 026	470		
East-Kazakhstan	39 107	14 590	7 492	2 450	1 8981	6 605
Zhambyl	18 927	9 459	5 472	3 077	10 331	4 986
Karaganda	5 072	2 609	2 840	1 537		
Kostanay	37 018	17 418	15 766	6 902	1 167	516
Kyzylorda	2 085	991	1 473	694	278	141
Pavlodar	22 743	6 685	2 443	1 076	15 311	3 450
North-Kazakhstan	39 062	14 047	25 449	9 435	463	249
South-Kazakhstan	7 896	266	7 896	266		
Kazakhstan	311 478	129 159	99 564	37 920	105 273	45 330

Sources: MoA; State JSC Asyl-Tulik.

Table 10: Criteria for subsidy for productivity and quality of livestock products

	Indicator	Unit	Availability
For producers involved in milk production (level I)			
1.	Availability of own breeding stock of cows and heifers (over 2 years)	head	Not less than 700
2.	Of which % of pedigree livestock	%	100
3.	Annual average livestock of dairy cows	head	Not less than 500
4.	Availability of modern dairy complex with developed infrastructure		
5.	Availability of modern high-technology dairy equipment (dairy premises)		
6.	Coverage of dams with artificial insemination	%	100
7.	Availability of own fodder base		
8.	Veterinarian well being		
9.	Subsidy size, T 20/kg		
For producers involved in milk production (level II)			
1.	Availability of own breeding stock of cows and heifers (over 2 years)	head	Not less than 150
2.	Of which at least 50% of pedigree livestock		
3.	Average annual livestock of dairy cows	head	Not less than 100
4.	Coverage of dams with artificial insemination	%	100
5.	Availability of own feed base		
6.	Veterinarian well being		
7.	Subsidy size, T 11/kg		
For producers involved in milk production (level III)			
1.	Availability of own breeding stock of cows and heifers (over 2 years)	head	Not less than 50
2.	Average annual livestock of dairy cows	head	Not less than 30
3.	Including of those reproduced at own farm	%	Not less than 100
4.	Coverage of dams with artificial insemination	%	100
5.	Availability of own feed base		
6.	Veterinarian well-being		
7.	Subsidy size, 5 T/kg5		
For artificial insemination			
1	Norm of subsidies for artificial insemination per head of cows and heifers, T 1 000		

Source: MoA.

ANNEX 2: PROFIT AND LOSS ANALYSES

Highlights on four livestock sub-sectors in Kazakhstan

Profit And Lost Analysis:
From Intermediary to Milk Collector/Transporter and Dairy Product Wholesaler to Retailer

Table 11: Intermediary to milk collector/transporter

Item	Farm	Farm	Farm	Farm	Diary plant	Farm	Milk chilling centre	HHFs	Small trader/transporter
	Akmola	Almaty	East-Kazakhstan	North-Kazakhstan	East-Kazakhstan	Akmola	Almaty		
Purchase milk Price farm-gate	51.7	40.0	50.0	41.0	49.0	29.4	30.0	25.0	30.0
Milk collection point/chilling equipment	0.0	0.0	0.9	0.0	0	0.0	0 9	0	0.9
Wages	0	0	0.4	0	0	0	0.8	0	0.8
Depreciation	0	0	0.7	0	0	0	0.7	0	0.7
Transportation	0	0	3	0	3	0	3	3	3
Taxation	0	0	0	0	0	0	3	2.5	3
Collection cost	**51.7**	**40.0**	**55.0**	**41.0**	**52.0**	**29.4**	**38.4**	**30.5**	**38.4**
Government support									
Reduced interest rates	0	0	0	0	0	0	0	0	0
Tax relief	0	0	0	0	0	0	0	0	0
Subsidies	0	0	0	0	0	0	0	0	0
Total subsidies	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Sale milk price to processor	51.7	40	60	41	52	29.4	45	80	40
inc.VAT 12%			6.4				0	0	0
Net profit/loss			5.0				6.6	49.5	1.6
Performance									
Price margin			5.7				7.3	49.5	2 3
Profitability, %			10.4				19.0	162.3	6.0
Competitiveness								Typical of villages close to urban area	
Risk assessment								Low quality of milk; risk of not selling at good price	
Notes	Processing at own dairy plant	Processing at own dairy plant	Transporting to dairy plant	Processing at own dairy plant	Transporting from dairy farm	Processing at own dairy plant	Collecting milk from HHFs, chi ling and transporting to dairy	Selling to bazaar	Collecting milk directly to chilling tank and transporting to dairy

Source: Calculations based on field visits, interviews and assumptions.

Table 12: Intermediary to wholesaler

Item	Farm/small-scale dairy plant	Farm/small-scale dairy plant	Farm/ medium-scale dairy plant	Medium-scale dairy plant	Large-scale dairy plant	Large-scale dairy plant	Small trader	Dairy plant	Trading company	Small farm (family-based)	
	Pasteurized	Pasteurized	Pasteurized	Pasteurized	Pasteurized	Pasteurized	Pasteurized	UHT	UHT	UHT	Non-pasteurized
Pasteurized/UHT milk (3 2% fat content) price	59.5	51.6	84.4	62 3	81.6	89.5	98.0	118.0	110.3	118.0	45 2
Distribution	3	3	3	2	2	3	3	3	2	1	2
Maintenance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Storage cost	0	0	0	0	0	0	0	0	0	0	0
Labour	1	1	1	1	1	1	1	1	1	0 5	1
Subtotal costs	**63.6**	**55.7**	**88.5**	**65.4**	**84.7**	**93.6**	**102.1**	**122.1**	**113.4**	**119.6**	**48.3**
Overheads											
Loan repayments	0	0	0	0	0	0	0	0	0	0	0
Leasing charges	0	0	0	0	0	0	0	0	0	0	0
Depreciation	0 5	0.5	0.5	0.5	0.5	0 5	0 5	0 5	0.5	0 5	0.1
Taxation	0 2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0 9
Wholesale cost	**64.3**	**56.4**	**89.2**	**66.1**	**85.4**	**94.2**	**102.7**	**122.7**	**114.1**	**120.2**	**49.3**
Pasteurized/UHT milk sale price to retailer	100	95	105	110	105	115	110	130	125	135	110
inc.VAT 12%	4 9	5.2	2 5	5.7	2.8	3.1	1.4	1.4	1.8	2.0	7.8
Gross profit/loss	10.1		0 5	4.3	4.2	6 9	5.9	5 9	9.1	12.8	52.9
Tax on profit	2.0	0.0	0.1	0.9	0.8	1.4	1.2	1 2	1.8	2.6	10.6
Government support	0	0	0	0	0	0	0	0	0	0	0
Reduced interest rates	0	0	0	0	0	0	0	0	0	0	0
Tax relief	0	0	0	0	0	0	0	0	0	0	0
Subsidies	0	0	0	0	0	0	0	0	0	0	0

Item	Farm/small-scale dairy plant	Farm/small-scale dairy plant	Farm/ medium-scale dairy plant	Medium-scale dairy plant	Large-scale dairy plant	Large-scale dairy plant	Small trader	Dairy plant	Trading company	Small farm (family-based)	
	Pasteurized	Pasteurized	Pasteurized	Pasteurized	Pasteurized	Pasteurized	Pasteurized	UHT	UHT	UHT	Non-pasteurized
Total subsidies	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Net profit/loss	8.1	0.0	0.4	3.4	3.4	5.6	4.7	4.7	7.3	10 2	42.4
Performance											
Price margin	7.6	0.0	-0.1	2.9	2.9	5.1	4 2	4.2	6.8	9.7	42 3
Profitability	12.8	0.0	0.5	5.2	4.0	5 9	4.6	3.8	6.4	8 5	87.7
Competitiveness							Moderate				
Risk assessment							Low				
Notes	Selling to retail; fresh milk products	Selling to State institution via tenders; vertical supply chain: farm–processing–niche product	Selling to retail; fresh milk products	Selling to retail; fresh milk products	Selling to retail; fresh milk products	Selling to retail; fresh milk products				No interest in short-life products	Niche product; sold to catering in bulk

Source: Calculations based on field visits, interviews and assumptions.

Table 13: Seller to retailer

Item	Supermarket (UHT)		Medium-scale shop		Small shop		Kiosk	Bazaar	
	From dairy	From wholesaler	From dairy	From wholesaler	From farm	From wholesaler	From dairy	UHT	Pasteurized
Pasteurized/UHT milk (3 2% fat content) price	125.0	130.0	110	110	100.0	110	110.3	130	95
Store	0.4	0.4	0 3	0.3	0 2	0.2	0.1	0.1	0.1
Labour	0 3	0.3	0 2	0.2	0 2	0.2	0.1	0.1	0.1
Subtotal costs	**125.7**	**130.7**	**110.5**	**110.5**	**100.4**	**110.4**	**110.5**	**130.2**	**95.2**
Overheads									
Loan charges	0	0	0	0	0	0	0	0	0
Leasing charges	0	0	0	0	0	0	0	0	0
Depreciation	0.8	0.8	0 5	0.5	0 2	0.2	0.1	0.1	0.1
Taxation	0 2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Retail cost	**126.7**	**131.7**	**111.1**	**111.1**	**100.7**	**110.7**	**110.7**	**130.4**	**95.4**
Pasteurized/UHT milk sale price to end-consumer	145	150	115	120	110	115	115	140	105
inc.VAT 12%	2.4	2.4	0.6	1.2	1 2	0.6	0.564	1.2	0
Gross profit/loss	15 9	15.9	-0.6	7.7	8.8	3.7	3.7	8.4	9.6
Tax on profit	3 2	3.2	-0.1	1.5	1.8	0.7	0.0	0.0	0.0
Government support									
Reduced interest rates									
Tax relief									
Subsidies									
Total subsidies	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Net profit/loss	12.7	12.7	-0 5	6.2	7.0	3.0	3.7	8.4	9.6
Performance									
Price margin	11.9	11.9	-1.0	5.7	6.8	2.8	3.6	8.3	9 5
Profitability	10.1	9.7	-0.4	5.6	7.0	2.7	3.4	6.5	10.1
Competitiveness									
Risk assessment									
Notes									

Source: Calculations based on field visits, interviews and assumptions.

Highlights on four livestock sub-sectors in Kazakhstan

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