Highlights on four livestock sub-sectors in Kazakhstan

Sub-sectoral cross-cutting features and issues

SUB-SECTORAL CROSS-CUTTING FEATURES AND ISSUES

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These "Highlights on four Livestock sub-sectors in Kazakhstan" have been prepared by the FAO Investment Centre Division in collaboration with the Analytical Centre of Economic Policy for the Agricultural Sector (ACEPAS); a company belonging to Kaz-agroinnovation of the Ministry of Agriculture (MoA) of Kazakhstan. The work has been financed entirely by FAO. The purpose of these reports is to help potential investors acquire basic knowledge about the technical features of the meat, dairy and wool sub-sectors in Kazakhstan as well of their domestic and international market positions.

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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 STRUCTURE

Organizational structures and dynamics of the livestock population

The official classification of farms, as reflected in the statistics, is based on their degree of integration in the formal trade chain and payment of taxes. Three categories are distinguished:

(a) *Household farms (HHFs)*: these are small farms that produce for home consumption and informal trade.

(b) *Peasant farms (PFs)* are small farms that are registered and usually employ some hired labour, but do not have a value-added tax (VAT) number.

(c) *Agricultural enterprises* (*AEs*, or commercial farms) including State and other production organizations (cooperative agricultural enterprises, partnerships, joint stock companies, agricultural firms, etc.), and the farms of enterprises and organizations (C-farms).[1]

Household farms: The term "household farms" refers to backyard farms within the plots of rural villagers. The villages were formerly the centres of State farms, and their inhabitants are the former employees of these farms. The HHFs are very small, owing to the physical limitations of household plots, and are dedicated to livestock keeping and horticulture. They have access to communal pastures around the village. Owners may also hire herders to graze their animals.

Peasant farms: Peasant farmers often use barns of the former *kolkhozes* in open pastureland, and also maintain their homes in the village. In larger villages, they tend to live on the outskirts. PFs are medium-scale farmers/ranchers, and should not be considered "peasants" in the common sense of the word.

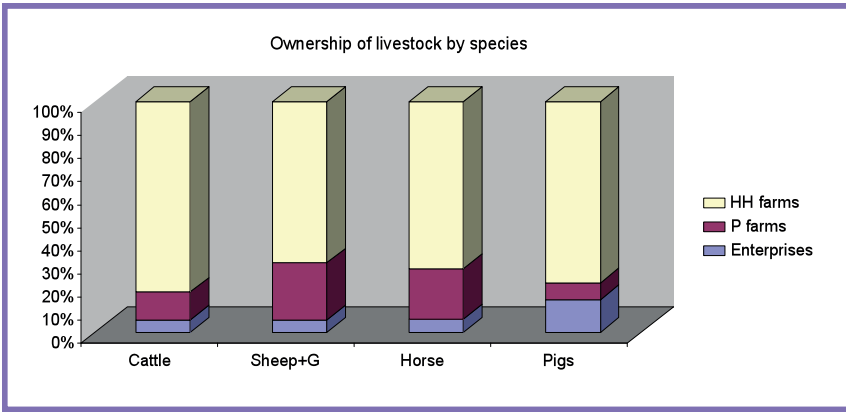
1.- In some tables commercial and State farms are referred to jointly as "C & S farms".

Agricultural enterprises. These comprise:

- groups of corporate farms or cooperatives that are remnants of the previous State farm system; currently, most of these farms have been restructured and broken up, but some very large farm companies remain;
- independent landowners or landowning companies, which are generally urban landownership companies that have accumulated large landholdings, which they use for agriculture or recreation (mainly hunting), or sublease to herders or other land users;
- government enterprises, including breeding farms, research institutes, etc.

Numbers of farms and animals in each category are given in Annex 1, Tables 1 and 2[2] and in Figure 1.

Figure 1: Ownership of livestock, by species



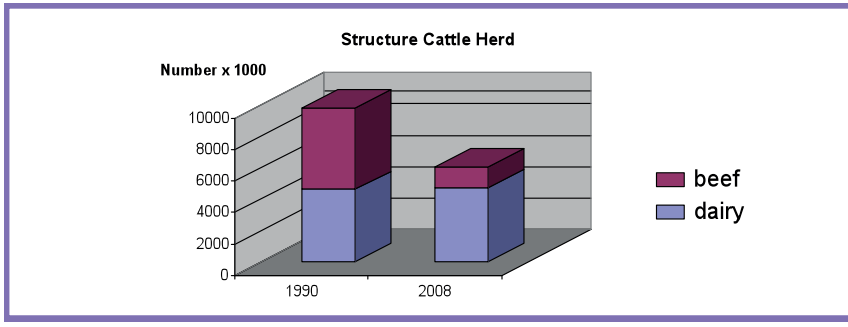
It can be noted that currently by far the majority of animals are found in the HHF category. This has important implications for the marketing structure, as livestock from HHFs is traded in the informal circuit, escaping VAT and veterinary inspection.

Numbers are recovering from the crash after the break-up of the Soviet

2.- 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

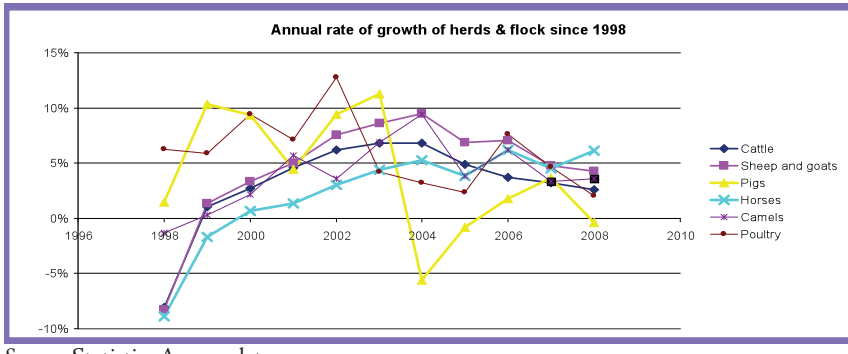
Union. However, the restoration has not returned to previous animal production patterns. One important difference is that in the Soviet period the majority of the cattle kept in *kolkhozes* were beef animals, while most of the cattle kept today in HHFs are used for milking. Estimates of the cattle herd that could still be classified as beef animals vary from about 700 000 to 1.3 million head (claimed by the sector specialists at the Ministry of Agriculture [MoA]). Figure 2 gives a quantitative impression of the present situation.

Figure 2: Structure of the cattle herd



The fastest recovery of the grazing animal herd occurred in 2001 to 2004 (Figure 3), when the cattle herd grew at 7 percent per year and the sheep and goat herd at 8 to 9 percent. In recent years, these growth rates have slowed to 3 percent and 4 to 5 percent respectively. HHFs seem to have stopped expanding.

Figure 3: Annual rate of growth of herds and flocks since 1998



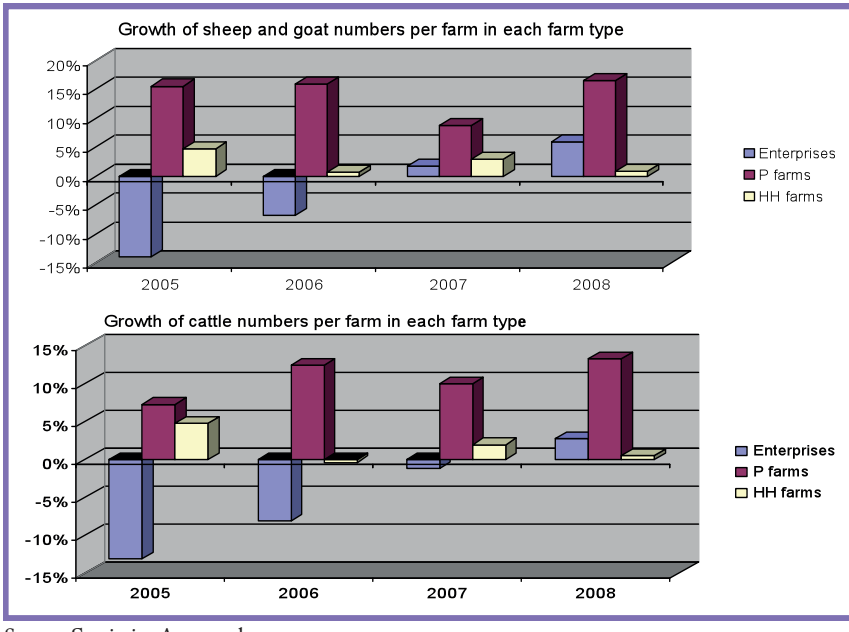
Source: Statistics Agency data.

Changes in pig numbers have varied swung, with rapid increases in 1999, 2002 and 2003, a downturn in 2004, and a recovery thereafter. Such a pattern is likely to reflect market conditions. It is reported that the limitation of imports from China has had a considerable impact, resulting in price increases. It is also alleged that undeclared VAT-free imports have been taking place.

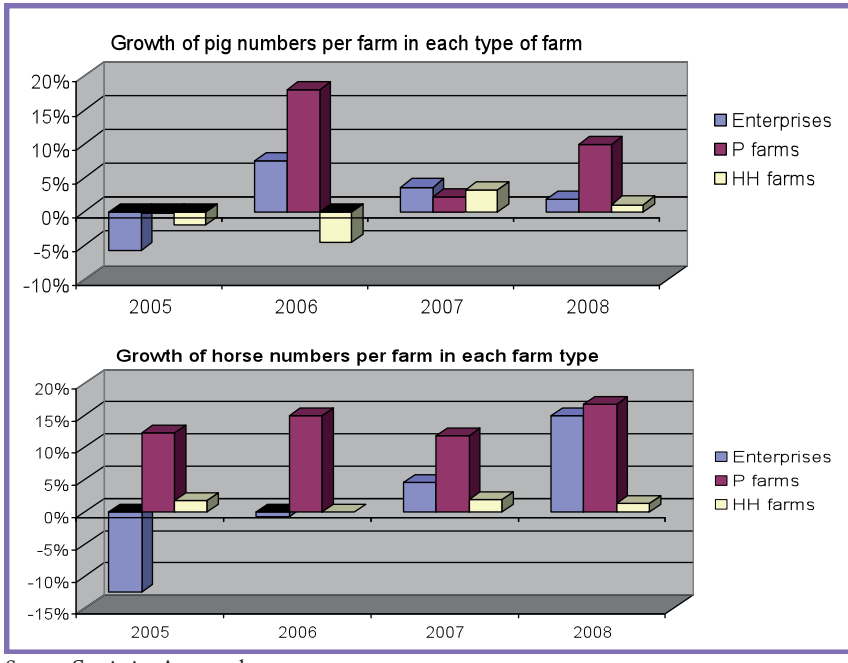
Of all animal species, the herd of horses is growing the fastest. This is reflected in the live animal market, where the prices for breeding horses are well above their value as slaughter animals. The interest in horses is because the local horse is a hardy animal, capable of withstanding harsh winter conditions, and it commands a good price on the meat market. It is thus excellently suited to the basic farming conditions of the newly emerging livestock sector.

A significant trend is that animal numbers on PFs are increasing rapidly. The rates of increase are shown in Figure 4. These data suggest the clear emergence of a category of medium-scale farmers.

Figure 4: Relative growth of four livestock species per farm, by farm type



Source: Statistics Agency data.



Source: Statistics Agency data.

The steady growth of PFs has resulted in average herd sizes that are adequate for viable farm enterprises. Currently, 70 percent of PFs' cattle are in herds of more than 50 head, 59 percent of sheep are in herds of more than 500 head (Figures 5 and 6 and Table 2).

Figure 5: Size distribution of cattle herds on peasant farms

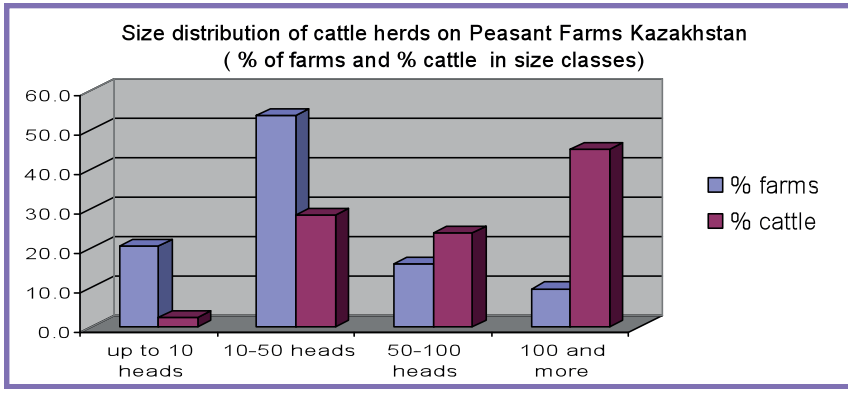
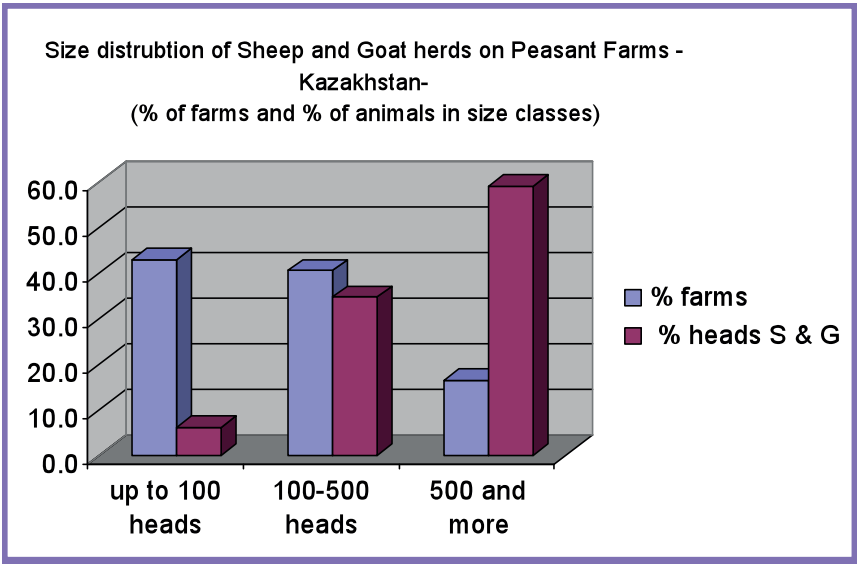


Figure 6: Size distribution of sheep and goat herds on peasant farms



Livestock numbers on PFs and AEs are shown in Table A.1

Table A.1: Average herd and flock sizes, by farm ca

Farm category	% with cattle	No. with cattle	Cattle, '000	Average herd size, '000	% with sheep and goats	No. with sheep and goats	Sheep and goats, '000	Average flock size, '000
AE	12%	849	321	378	8%	594	903	1 519
PF	8%	16 155	720	45	7%	14 526	4 183	288
HHF	n.a. If 50% -->	1 116 000	4 967	4	n.a. If 50% -->	1 116 000	11 852	11

Sources: Statistics Agency; own calculations (2008).

To a large extent, cattle farms and sheep and goat farms overlap. The total number of PFs is 194 000. The large majority are crop farmers or producers of vegetables. It is assumed that PFs that are not registered as livestock farms nevertheless often keep a few animals at home and that *for their livestock activity* they are counted as HHFs.

Meat production: Data on meat production by farm sector, provided[3] by the Statistics Agency, are given in Table A.2,[4] which shows that HHFs are the largest sector in terms of volume of production, followed by PFs. In the short term, until production technologies change, the dynamics of production volumes will run parallel with the livestock numbers shown in Table A.1.

Table A.2: Meat production, by farm type

'000 tonnes, slaughter weight (SW)						
Farm type	Cattle	Sheep and goats	Pigs	Horses	Other	Total
AEs	14.0 (20)	3.0 (13)	11.9 (18)	0.7	0.3	29.9 (58)
PFs	35.9 (48)	24.2 (40)	6.1 (12)	9.3	1	76.5 (120)
HHFs	350.2 (296)	103.6 (109)	188.2 (115)	56.3	4.2	702.5 (585)
Total	400.1 (364)	130.8 (162)	206.2 (145)	66.3	5.5	808.9 (762)

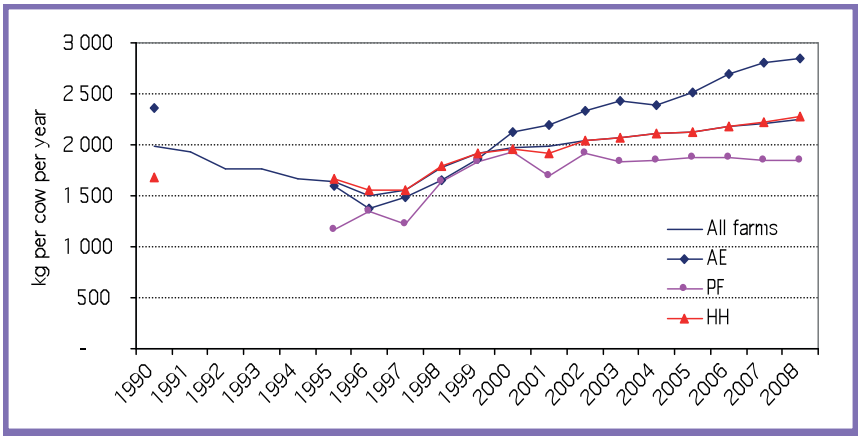
Sources: Statistics Agency; estimates based on analysis of production models (shown in brackets).

Milk Production: Milk production has been increasing by an annual average of 4.5 percent, almost returning to its 1990 level (of 5.6 million tonnes) in 2008, when it was 5.2 million tonnes, or about 1 percent of the global total. Milk yield per cow has also been increasing over the last ten years, by an average of 1.8 percent per year. In 2008, it exceeded its 1990 level (1 988 kg/cow/year) to reach 2 253 kg (Figure 7). 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).

3.- The Statistics Agency bases its production figures on head counts and sample surveys examining productivity parameters. Although this method is correct, limited data from the field and simulation of a similar model to that of the agency, produced figures that implied lower pork production, lower beef production from HHFs, and possibly higher mutton production.

4.- Statistics Agency data suggest that the productivity per pig is better on HHFs than on large-scale farms. This cannot be correct. Alternative estimates for production are 18 000 tonnes from AEs, 12 000 tonnes from PFs, and 115 000 tonnes from HHFs.

Figure 7: Milk yields, by farm category, 1990 to 2008



Source: Statistics Agency.

Villages and farms

In the remote and sparsely populated lands, farming and livestock production are based on the existence of villages and barns for livestock herders as they move the animals to pastures at increasing distance. For very remote grazing, *yurts* (tents) are still used. The villages provide housing for labourers on large farms and for small independent family farms, and supply essential services such as electricity and education, depending on the size of the village. The villages also house elderly people, mostly former employees of *kolkhozes*, who earn some income from keeping a few animals. Young people are less inclined to keep animals, and seek better futures in towns. This harbours a risk that livestock herds will in gradually decrease, unless professional farmers take over from HHFs.[5]

The villages were formerly the centres of *kolkhozes*. Village inhabitants are still often entitled to rent arable land in the former *kolkhoz* area. This gives them the right to lease the land for 49 years, with an option to buy it.

5.- In the Russian Federation, cattle numbers have been declining for some time, and a 3.5 percent decline was expected in 2009 (USDA, GAIN report, Russian Federation Livestock and Products Semi-Annual Report – 2009). Considering the similarities in production structure between the Russian Federation and Kazakhstan, close monitoring of the age of livestock owners is recommended in Kazakhstan.

Subleasing is not permitted, but a common practice on cropland is for the title holder to be a nominal partner in the AE that succeeded the *kolkhoz*. No such arrangement exists for natural pastureland, but it is possible to lease rangeland outside the immediate vicinity of the villages. Where such land has not been leased or otherwise assigned to special purposes it can be used by anyone.

Animal keeping by HHFs was common in Soviet times, and is thus a deeply engrained tradition.[6] The animal keepers living in a village could be grouped into the following categories:

(a) Small farmers by necessity:
- elderly people trying to survive;
- unemployed people who practise farming as a temporary necessity;
- seasonally employed labour of large-scale farms, who need to supplement their income.

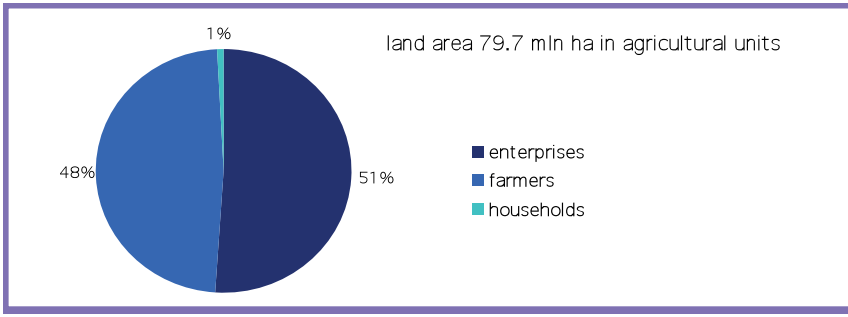
(b) Small farmers with ambition:
- full-time labourers on large-scale farms, who also keep animals on their own;
- small- and medium-scale farmers, who aim to retain control over their land allocation and see farming as their future; most of these farmers are in the PF category, living on the edge of a village or outside the village, or with a "dacha", a facility or yard outside the village.

The case of sheep holders

The current agricultural land allocation according to the latest Agricultural Census is shown in Figure 8. Although large-scale enterprises control most agricultural land, PFs are the principal sheep breeders. About 40 percent of the sheep flock is held in units of fewer than 50 animals (Figure 9). Only 8 percent is concentrated in relatively large farms with more than 2 000 head. These are the depositaries of what remains of the registered pedigree stock of fine wool producers.

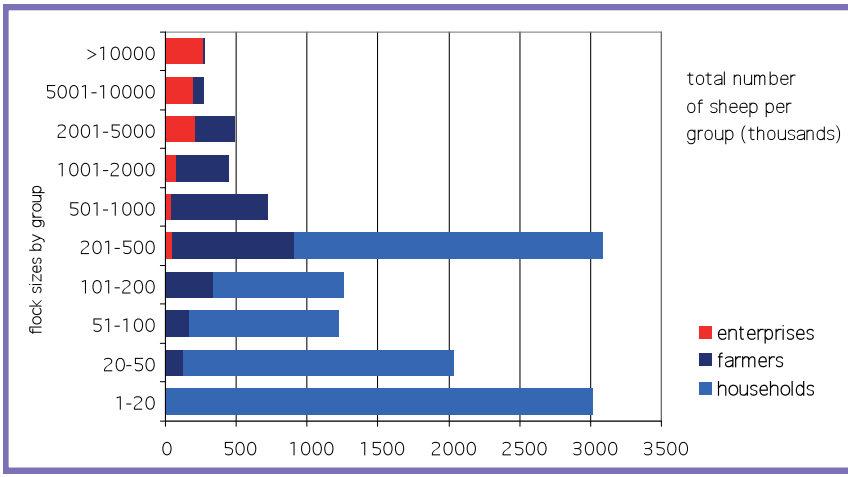
6.- As in other regions of the world, more active farm labourers often engage in small-scale AEs of their own.

Figure 8: Distribution of agricultural land, by farmer category



Source: Agricultural Census, Statistics Agency, 2009.

Figure 9: Sheep flock structure, 2007



HHFs hold half of the national sheep flock (about 40 to 50 percent), have least control over land, and are fundamentally subsistence- or semi-subsistence-oriented. Sheep are grazed in common flocks of animals belonging to several (five to 30) neighbouring households (each owning from 1 to 50 head), which employ a shepherd at an agreed fee. Animals are grazed close to settlements (within 1 to 5 km) on common rangeland owned by the State or the local *akimat*; at night animals are usually kept in household yards. Fodder and hay are purchased, or collected from hayfields using rented machinery (sometimes belonging to one of the HHFs). Feed

(wheat, maize, barley, bran and backyard residues) is usually procured from AEs and milling units at the rate of 0.5 1 kg/head/day during the stabling period. Wool is shorn once or twice a year, with a yield of 2 to 4 kg/sheep. Shearing is carried out with scissors by the shepherd in the open air, and there is no pressing equipment. Wool is used for household consumption and local handicrafts (quilts and pillows, knitwear, etc.), but surplus is generally destroyed owing to lack of demand.

PFs are commercially oriented, involve groups of relatives, and hire 15 to 50 percent of their total labour requirements. They include advanced HHFs that have upgraded themselves into small *semi-commercial farms* rearing 200 to 500 head of cross-bred sheep, mainly for commercial purposes but also including some self-consumption (10 to 20 percent). Such farms tend to maintain their current status to avoid entering a higher tax regime. PFs hold an estimated 25 to 30 percent of the total sheep flock, and is quite widespread across Kazakhstan, but with higher concentration in the south. Family labour (for management, trade and procurement) is complemented by one to three hired labourers for husbandry and seasonal peaks (haymaking, sowing, lambing). The farm base is usually located 5 to 30 km from the settlement, and surrounding pastures are utilized. Flock owners may live in cities and frequently visit their farms for operational control. Such farms are not specialized and market a mix of crop and animal products. Farmland is leased (from 1 to 10 ha) primarily for forage production (oats, alfalfa, maize). Farmers sometimes join a producers' cooperative for joint activities (e.g., sowing of fodder crops), but their technological level is poor. Sheep are shorn once or twice a year (always in spring and sometimes also in autumn). Coarse and/or semi-coarse wool output in the northern areas is not normally marketed owing to low marketing activities; in southern and eastern areas, wool is stored and periodically sold.

Larger-scale farms raise from 2 000 to 12 000 sheep as a primary activity; these are mostly cross-bred fat-tail sheep. Ownership is concentrated among close relatives (four to ten family members) who manage the farm and employ workers on fixed and occasional bases. Some of these farms have evolved from former *kolkhoz* management; others are upgraded semi-

commercial farms. These farms are scattered throughout the country but not in northern areas. Sheep are seasonally grazed on remote State reserve pasture areas on a free (in desert and semi-desert areas) or long-term lease (in foothill-steppe zones) basis. Grazing is practised all year round, hay is collected and on-farm forage production is not developed. Occasionally, feed is purchased from specialized companies. Shearing is carried out with the use of electric clippers, but farms normally lack wool classification systems. Often farms have their own presses and accept wool from HHFs. The wool is stored and then delivered to wool primary treatment (WPT) or felt factories. This type of enterprise has efficient networks and good relationships with local authorities. They generally record higher profitability and have expansion plans. Farms of this type own 20 to 24 percent of the total sheep stock, but their role is increasing rapidly.

AEs are purely commercial and use hired labour as their primary workforce. They are usually owned by shareholders, while a minor portion is owned by State bodies or State companies. These own from 3 000 to 20 000 sheep, and about 50 hold pure-bred fine wool or semi-fine wool sheep. The certified pure-bred fine wool breeding farms, which are highly subsidized, are included in this category of producers. Their share is approximately 5 to 6 percent of the total flock. The ownership of each AE consists of 100 to 500 shareholders (former collective *kolkhoz* farmers), often headed by an elder manager, who held a senior position during Soviet times. Seasonal employees are often hired, including those living outside the AE. Distant grazing is practised on summer alpine and desert pastures located 50 to 250 km away from the central farmstead. Infrastructure (housing, animal shelters, watering, tracks) established in Soviet times is utilized. Such units produce their own feed base (fodder, hay and concentrate feed) using arable land attached to the farm. The highest concentration of AEs is in the southern regions. Shearing is carried out at special points established and equipped during Soviet times. The classification of wool is carried out by specialists. The majority of these enterprises are unprofitable and many are on the verge of bankruptcy. Very few have adapted to modern management practices and free market rules. Their equipment capacity, technological level and up-to-date expertise among staff and management are generally low.

Regional features

Main regions: For the purpose of this analysis, the 14 *oblasts* (administrative regions) have been grouped according to broad climatic criteria[7] as shown in Table A.3.

Table A.3: Climatic zones of Kazakhstan

Zone	Oblasts included	Main features
1 South	Almaty, Zhambyl, South Kazakhstan	Mixture of lowland, hill and mountain grazing, interspersed with crop fields and horticulture
2 East	Eastern Kazakhstan	Hilly pastures and relatively moist mountain grazing; long winters
3 Central steppe	West Kazakhstan, Aktobe, Karaganda	Extensive arid, semi-arid natural pasture; long winters
4 North, dryland cropping zone	Akmola, Kostanai, Pavlodar, North Kazakhstan	Predominance of arable dryland farming (wheat); long winters.
5 Desert	Atyrau, Kyzylorda Mangistau	Very sparse vegetation

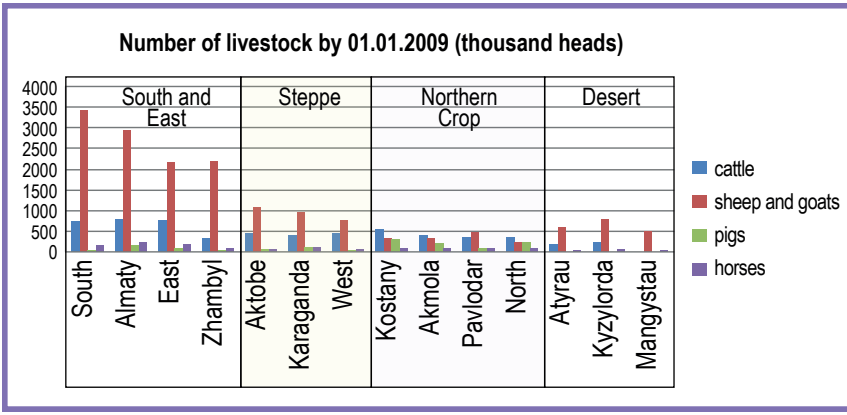
The largest populations of grazing livestock are found in the south and the east. Pigs are concentrated in the northern zone. When the *oblasts* are ranked in order of livestock numbers, they align automatically in the groups 1 to 5 (Figure 10, Table A.3, and Table 4), with the four *oblasts* with the highest livestock numbers falling in zones 1 and 2. The numbers of AEs and PFs with livestock in each zone are given in Table A.4.

Table A.4: Numbers of farms with grazing livestock, by zone

Zone	Farms with cattle		Farms with sheep and goats	
	AEs	PFs	AEs	PFs
1 South	231	6 033	232	5 239
2 East	51	2 831	31	2 791
3 Steppe	172	4 514	136	3 919
4. North	354	989	133	851
5. Desert	38	1 786	60	1 725
Total	**846**	**16 153**	**592**	**14 525**

7.- A rainfall map is given in Annex 2.

Figure 10: Profile of livestock numbers, by climatic zone



(1) **Southern mountain foothills:** This area has mixed cropping and livestock: dryland wheat, irrigated horticulture and grazing, mainly by sheep. The grass wilts during the very hot summers. Most of the sheep are then herded higher up into the mountains. The area has many small streams. Almost all the livestock is kept by HHFs living in villages that are larger than those in the centre and north. Two different sheep production systems exist: one with heavy winter feeding and two lambings; and one with only one lambing. The fat-tail sheep are popular for the special fat in their tails. The region has ample milling by-products (from Almaty to Shymkent). Horticultural farms constitute a market for manure.[8] Large-scale livestock farms are relatively rare. In Almaty, for example, one fine wool sheep breeding farm with breeding farm status has 20 000 sheep, including 11 000 ewes. The relatively densely populated zone in the foothills is a traditional transit zone for transhumant herds that graze in the lower desert in winter and move to the mountains in summer. The owners of these herds complain about blocking of their routes by crop fields. Recuperation of the transit routes would allow better use of range resources, but should be accompanied by strengthening of the veterinary control of transitory herds. Transhumant herds may carry latent infections of tuberculosis (TB), brucellosis and other diseases; however, it is difficult for the veterinary service to monitor these herds.

8.- 50 km west of Almaty the sales price of manure was 3 000 tenge (T) per cart load in December 2009.

(2) **Eastern highlands:** The eastern highlands are a traditional livestock region. Sheep are abundant. In the region there is not much agriculture, so there are few locally available crop by-products for feeding. Most livestock depends on grazing, and winter feeding is minimal. Hardy types of animals are popular in the east. After the transition, this region lost a principal meat factory that used to supply the Soviet army. The eastern region also contains the former Semipalatinsk nuclear testing site.

(3) **Steppe:** In the central dryland zone, wheat production has been attempted, but is now largely discontinued. Despite the very sparse rural population in this region, there are a significant number of PFs and livestock AEs (more than 4 500). Villages are smaller than elsewhere and do not have links to cropping farms. In areas that are not far from towns, dairy is the principal output rather than meat animals. This results in situations where, although village grazing areas are not constrained by surrounding wheat land, farmers are not able to expand their cattle numbers because the pastures near villages are overgrazed. At night, farmers keep their cattle at home for milking, thus reducing the area where grazing is feasible to within a certain radius around the village. For hay, these farmers depend on poorly run privatized mechanization centres. The arid conditions in this region reduce the period of fresh green grass and the productivity of the stock.[9]

(4) **Northern dryland cropping zone:** Villages in this zone are usually situated near streams and ponds, in areas of pastureland of 600 to 1 000 ha. Each of these areas is surrounded by 2-km squares of land for cropping (400 ha). Occasionally additional natural pastureland can be found at a distance on low-lying land or hills that are not suitable for crop farming. Villagers often pool their land rights with those of the main owners of the new commercial farm, obtaining animal feed in return, which is the nominal produce of their pieces of land. Animal feed consists of broken or second-quality grain, hay and some bran. The use of village pastureland

9.- In this region, the World Bank-funded Drylands Management Project, from 2004 to 2009, reseeded old wheat land areas for pasture and demonstrated alternative land-use systems, proving the economic and social feasibility of livestock-based production systems in similar ecosystems, and introducing practical improvements to winter feeding and livestock marketing. Attention was also given to improving local management systems, biodiversity, carbon sequestration and the use of solar panels in remote areas.

appears unregulated. Small-scale farmers have mixed herds of any combination of pigs, cattle, sheep, goats and poultry (chickens, geese and ducks). Cows are kept at home for milking. When conditions are suitable, the cows graze on the village grazing area during the day. This land is overused. Other grazing animals are given into the care of herders who graze them on distant grazing lands, which are not heavily used. This leaves an unused dry grass cover that can fuel fierce wildfires.10 The reduction in cattle numbers has been most severe in this region. The former State farms were mixed farms with about 20 percent of their arable land used for forage and temporary pasture. Most large farms are now devoted to near mono-cropping of wheat. Owners prefer to concentrate their investments in wheat production and/or to engage in farming only for part of the year. Exceptions include a few farms near Kostanai with successful ruminant livestock businesses (see following box).

Livestock undertakings in Kostanai

A wheat farm with 6 000 ha of wheat is linked to an intensive dairy farm with 600 cows of a local breed (reported to yield about 6 000 litres of milk per year), which is preparing to expand to 1 000 pure-bred Holstein cows. When the study team visited, a large rotary milk parlour and free housing sheds with cubicles were under construction. The cattle were fed mainly from farm resources, derived from about 1 500 ha of forage crops, broken wheat and peas. Another larger farm (Karaman farm) has 50 000 ha of wheat and 6 000 ha of pasture. The livestock consists of 1 500 beef cows, 2 000 beef young stock and fatteners, 1 500 sheep and some horses. It has established special breeding herds and two feedlots, one for animals bred on the farm and another, at a different location because of sanitary risks, for young steers bought from HHFs. In addition, the farm operates a small but very modern and well-equipped slaughterhouse with freezing capacity. On this farm 400 labourers are employed all year round.

(5) **Semi-desert regions:** These are sparsely populated and supply green vegetation only for short periods, which is used by medium- and large-scale sheep owners. To reach summer pastures on the mountains, they have to traverse the rather densely populated foothills. This poses two problems: first, as already noted, the transit routes are often blocked by farmers' crops; and second, as officials located in the foothills indicate, only farmers from the foothills ("farmers from here") are entitled to graze in the mountain areas.

10.- Although autumn fires can have a beneficial short-term effect on the emergence of new vegetation the following spring, in the long term, fires debilitate natural pastures owing to the disappearance of mulch and associated moisture retention capacity and the volatilization of nitrogen.

Regional differences in cattle herd structure emerge from the statistics on the percentage of breeding cows in the herd (Table A.5 and Table 4). When male calves are sold at a young age, the percentage of cows in a herd is high. This indicates that feed resources are scarce and are in devoted first to milk production. When the percentage of cows is low, the opposite is the case, and the herd is oriented towards beef production. The tables show that in the cropping regions and near large cities (Almaty and Karaganda), HHFs are oriented to milk production and sell their calves early. This is understandable because of limitations on the grazing area between areas of cropland, and because of the larger human population and demand for milk. Among PFs, a high portion of breeding cows is found in south Kazakhstan and Karaganda. In south Kazakhstan, fewer cattle are owned by PFs (16 000). In Karaganda, on the other hand, PFs own nearly 70 000 cattle. Clearly, these farms are oriented to selling milk to Karaganda city, a mining town. Elsewhere, PFs have a medium position regarding herd numbers, except for in Almaty, where the percentage of breeding cows in the herds of PFs (totally 213 000 cattle) is very low. This merits further investigation, but one explanation would be that PFs herd or fatten young stock that comes from HHFs.

Table A.5: Percentages of breeding cows in cattle herds, by farm category and region

Region		Total cattle	AEs	PFs	HHFs
		'000	% cows	% cows	% cows
	Kazakhstan	6 008	33%	39%	46%
South	Almaty oblast	798	36%	28%	56%
	Zhambyl oblast	321	39%	40%	40%
	South Kazakhstan	737	40%	51%	41%
East	East Kazakhstan	767	34%	42%	43%
Steppe	West Kazakhstan	439	33%	34%	39%
	Aktobe oblast	447	36%	36%	43%
	Karaganda oblast	407	37%	51%	52%
North	North Kazakhstan	351	32%	39%	53%
	Kostanai oblast	548	31%	37%	54%
	Akmola oblast	403	29%	38%	50%
	Pavlodar oblast	361	31%	39%	43%
Desert	Kyzylorda oblast	245	43%	41%	39%

Region		Total cattle	AEs	PFs	HHFs
	Mangistau oblast	10		45%	47%
	Atyrau oblast	172	43%	46%	45%
	Cities	3	-	-	-

Source: Calculated from Statistics Agency data as of 1 January 2009.

In regions with a high percentage of cows, there should be a substantial supply of young feeder stock (male weaners and yearlings) for fattening in feedlots. This applies especially to Almaty, where the base population of cattle is very large, at nearly 800 000 animals.

A trend for feedlots

Recently there has been a substantial interest in establishing beef feedlots. Five new feedlots are to be created in cooperation with United States farmers.[11] The Mal Onimderi State Company (MOC, see also section C) is establishing a feedlot, initially for 5 000 head, in Almaty. The aim is to produce meat for export. The animals are to be fed for one year from the age of six to seven months, starting at a weight of 200 to 220 kg and finishing at 450 to 500 kg. The establishment of additional cow-calf units that can supply weaners is foreseen. However, it is proving difficult find land for the cow-calf units within the region, so animals will be purchased to begin with. These will be subject to quarantine at first.

The MOC feedlot is a high-cost facility, with cattle yards provided with a subsoil drainage system. Investments include grain storage, silage pits, a meat factory, refrigeration and feed mixing equipment. For two units of 5 000 places, the projected equipment costs and working capital are within the range of those for similar operations elsewhere in the world. For the infrastructure they are higher, but this will be influenced largely by the nature of the slaughterhouse or meat processing plant that is included. Nevertheless, the costs are quite high in comparison with levels of investment for the Karaman farms referred to in the previous box (see also Table 5).

11.- A United States diplomatic mission press report of 28 November states: "Several Kazakhstani organizations are currently in negotiations with leading cattle experts from North Dakota to further develop Kazakhstan's livestock industry and rural economy. The North Dakota Trade Office and a group of North Dakota companies are sponsoring livestock production seminars on October 28 to 29 (2009) at Kaz-Agro."

In view of the large cattle herd in Almaty and the high percentage of breeding cows, supplying at least part of the animals for the feedlot from locally procured young stock should be advantageous. Moderately underfed young stock respond to "compensatory growth" when provided with good feed. However, substantial veterinary precautions would be required. To reduce risks, quarantine stations should be small or be set up on a two-tier system, with small portal units for initial screening. Flexible management is recommended, allowing the fattening regime to be adapted to the kind of young stock that is purchased. When good pastures can be secured, it could be an advantage to include seasonal grazing at the growing stage.

The Agro Credit Corporation (ACC), in collaboration with Kaz-Agro, has developed an integrated model for investment in feedlots, slaughter and processing. In ACC's description of the model,[12] the term "feedlot" includes the cow-calf operation. In the investment model, 1 100 cows are bought as basic stock for a 5 000-cattle unit. A simulation of the basic herd performance assumptions (90 percent weaning rate, 90 g weight gain per day) is given in Table 6. The authors expect a meat yield of 580 tonnes/year, but this is difficult to achieve. For the returns, it is assumed that the government will continue paying the existing subsidy of T 175/kg of meat. Even so, the integrated beef enterprise will only be marginally feasible as long as the operational costs per head of cattle remain below T 30 000/year. This is possible only if a significant part of the feed consists of cheap grazing. Applicants for credit are required to have lease title to 17 500 ha of grazing land and to have 1 000 ha of land under forage crops.

ACC and Kaz-Agro recommend locating the beef enterprises in the north of Kazakhstan in view of the epizootic situation. In the north, diseases are more easily contained, as herds are stationary and locked up between the cropping zones. On the other hand, the areas of available natural pasture are restricted in this zone, so the scope for expansion is limited.

12.- Presentation by ACC in collaboration with Kaz-Agro, October 2009 on the "Justification of the need to implement projects consisting of feeding grounds with developed infrastructure, a network of slaughterhouse units and meat complexes for the production of blocks of meat and primary cuts in vacuum packages".

For slaughter and processing of the output from beef farms, ACC and Kaz-Agro foresee a two-tier model with small basic slaughterhouses in rural areas and advanced meat packing plants in central locations. The rural slaughterhouses would have a capacity of only four to eight cattle per day, and 250 such units are proposed for three *oblasts* – Akmola, Kostanai and North Kazakhstan. The investment cost of the proposed model is a modest T 14.5 million/unit (about USD96 000). Refrigeration would be needed for a high-quality chain.

The proposed processing units can deal with 118 carcasses per day, or the output of about 20 large-scale ranches or 20 rural slaughterhouses. The input would consist of carcasses, the output being large primary cuts, portions of carcasses and miscellaneous products. The output would be vacuum-packed to have a shelf-life of several weeks.[13] The investment foreseen for these units is T 1 566 million (Table 5), of which T 400 million is for equipment.

Pig farms

A number of large pig farms supply meat to processing factories, mainly for the production of sausages. The productivity of these farms is somewhat lower than that of their international counterparts.

The largest numbers of pigs are kept in HHFs and small farms in units of one to 30 or 40 animals. These occur especially in the north, where the shortage of grazing land makes it relatively difficult to maintain grazing animals around villages, and social traditions favour pigs. HHFs commonly use crop by-products (broken wheat) from the AEs they work for.[14] The feed rations of HHFs are basic in nature and allow only slow growth, resulting in a poor feed conversion rate. Manufactured pig feed is available in the market (Table A.6).

13.- Meat and Livestock Australia mentions as: "typical shelf-lives": i) meats packed in oxygen, five days; ii) vacuum- and MA [Modified Atmosphere]-packed beef primals, 100 days at -1 °C, 84 days at 0 °C and 42 days at 5 °C; and iii) vacuum- and MA-packed lamb primals, 60 days at 0 °C and 35 days at 5 °C. The temperature should be as close to zero as possible at all stages along the cold chain.

14.- The structural link between HHF pig production and employment on a farm is illustrated by the example of Zarya village, where most people are shareholders in the company of the same name. They each get 5 kg of feed per working day, in addition to their salaries. They can buy additional feed at cost price. Other people who are not shareholders and retain a piece of land grow their own feed – peas, barley, oats, etc. They buy bran from sellers who go round the village on a truck every day – for T 140/sack.

Table A.6: Review of two factory rations for pigs

Criteria			Fattening feed		Starter feed, 2–4 months	
		Unit	Quantity	% of standard	Quantity	% of standard
Methionin	Required	g/kg	3.8		4.6	
	Provided	g/kg	3.1	83%	3.5	76%
Net Energy	Required	MJ/kg	9.42		9.42	
	Provided	MJ/kg	7.7	82%	9.04	96%
For the formula sold						
Bulk sales price		T/kg	19.2		42.3	
Ingredient cost[a]		T/kg	27.0		35.6	
For the least-cost formula to meet requirements						
Ingredient cost			18.5		24.5	

[a] According to market prices. The factory probably had cheaper ingredients (their own by-products).

Table A.6 shows that the feeds are not adequate for high levels of performance, but at little additional cost the quality could be substantially improved (mainly by reducing the amounts of barley, wheat, bran, fishmeal and sunflower cake and adding peas, maize and rye). This is possible if a good-quality protein cake can be obtained.

Large-scale pig farms show reasonable results, but are not on the same level as the international competition. This results partly from a lack of up-to-date infrastructure for animal feeding and animal breeding.

Pig farming example

A large-scale pig farm visited during the analysis mixed its own feed because it did not trust factory-made feed. The farm quoted prices for its ration mixes that were substantially higher than those in Table A.6, at T 30/kg for fattening feed and T 38/kg for starter feed. Despite this, the technical parameters of the pigs remained below international standards. This farm had 1 000 sows and their offspring (about 13 000). It employed a substantial labour force of 150 people, but expected to reduce this number with the planned mechanization of feeding. The manager considered the lack of qualified staff to be a priority problem. The farm lacked reliable factory-made feed of high quality, good breeding material, and examples of low-cost working methods and effective mechanization.

B

PUBLIC SUPPORT TO THE SECTOR

In recent years there was an effort to amalgamate small producers into larger cooperatives. This was not successful, mainly owing to a lack of trust and understanding among the people concerned. Lack of records of transactions and proper accounting were also mentioned as a limitation for cooperative activities. It should also be remembered that HHFs are rooted in a tradition of fully private activities that already existed during Soviet times. HHFs are a continuation of the previous backyard farm system, while PFs are new structures. The current policy thinking undervalues the small farm sector (both HHFs and PFs) on the reasoning that this sector exists on its own, does not need support, and would not be responsive to any support it did receive.

Subsidies: In the livestock sector, the subsidy system[15] operates through "targeted transfers from the national budget to the regional budget for subsidization of the improved productivity of livestock and the quality of livestock products". Budget resources for subsidies in 2009 amounted to T 11.7 billion (USD78 million). A breakdown by animal species and regions is given in Table 7. The aim of the subsidies is to support livestock improvement on farms. Three levels of farming are considered. The highest level receives the highest subsidy. The levels are largely defined by the size of the farm. Most PFs do not qualify for subsidies, because the smallest class of farms that can participate must have more than 70 breeding cows, which implies a herd of nearly 200 cattle (cows and young stock). The underlying assumption is that high-quality production is possible only on large farms. Class I farms, which receive the highest subsidy (Table B.1) must have at least 1 000 head of their own breeding stock. Class II farms need 100 and class III 70. Farms must also have an integrated fattening operation functioning throughout the year. This condition is a constraint

15.- Covered by the Law of 8 July 2008, On State Regulation of the Agro-Industrial Complex and Rural Areas.

to specialization. On the other hand, the requirements in terms of production performance or breeding efforts are very modest. Live weight (LW) at selling of slaughter stock must be a minimum of only 380 kg. The regulations do not specify requirements for animal breeding methods, except that in class I farms 90 percent of the breeding stock must be of pedigree status, in class II 50 percent, and in class III none need be. The subsidy per kilogram of SW sold are listed in Table B.1.

Table B.1: Subsidy for slaughtered weight sold (T/kg)*

Class of farm	Element subsidized	Amount of subsidy
Beef level I	Use of combined feeds	175
Beef level II	Use of combined feeds	138
Beef level II	Use of concentrate	90
Beef level III	Use of combined feeds	100
Beef level III	Use of concentrate	80
Pork		98
Poultry meat		66
Eggs		2.6

* The subsidy aims to reduce feeding costs on breeding farms, but it is granted according to the apparent production. The official calculation model in sub-tables 1 to 4 of Table 11 is based on the estimated use of feed to achieve a certain level of production.

The subsidy is substantial in comparison to a beef farm-gate price[16] of T 446/kg carcass weight (T 442/kg for pork). To claim the subsidy, a form with data has to be submitted to the *rayon* administration. An *oblast*-level committee then decides the allocation. Beneficiary farmers reported no negative comments about delays.

Subsidies for *sheep breeders* are of two types:

(a) A subsidy of 50 percent of the price is used when registered pure-bred young animals are sold. This is valid when pedigree centres and AEs are selling sheep, and agricultural producers are buying them. The subsidy is USD0.83/kg of LW (amounting to USD5.3 million from the 2009 budget).

(b) Fine wool is heavily subsidized at USD1.1/kg (T 162) of scoured clips (amounting to USD970 000 from the 2009 budget).

16.- Kaz-Agro-Marketing (KAM) in Kostanai, December 2009.

Poultry meat subsidies: During 2006, MoA introduced an extremely generous system of subsidies to support the vertically integrated poultry meat producers of Kazakhstan. However, as production subsidies are payable only to operations with a full cycle of commercial production, from pullets and breeders through to broiler farms and slaughter facilities, this rules out many smallholder operations, such as PFs and HHFs. For taxation purposes, meat production subsidies are deductible from corporate income.

Government spending on meat production subsidies amounted to a highly significant T 2.6 billion (USD17.5 million) during 2008. Subsidies increased from T 47/kg of chicken meat sold in 2007 to T 66 in 2008, with the amount actually paid to the industry rising from 48 to 70 percent of that allocated. These figures are shown in Table B.2, where actual 2008 production data were used to calculate the amounts received by industry as being equivalent to T 39.6/kg of meat, or approximately 13 percent of the total cost of poultry meat production. The budgeted total amount for subsidies was determined prior to 2008, when actual meat production figures were not yet known. However, given that actual production was 65 300 tonnes, and working on a budgeted allocation of T 66/kg, the total amount allocated to cover full production should have been T 4.3 billion instead of T 3.7 billion. The T 2.6 billion received by industry in 2008 represents only 60 percent of what the allocation should have been.

Table B.2: Comparison of poultry meat subsidies

Analysis of Poultry Meat Subsidies	2005	2006	2007	2008	2008 production
Subsidies Paid, million KZT	0	1.000	1.252	2.588	65.300 Tonnes actual production
Budgetted Subsidy value, KZT per kg meat	0	47	47	66	
Subsidies Budgetted, million KZT	0	14	9	13	
Actually Paid, as % Budgetted		7092,2%	13322,3%	19604,5%	39,6 KZT/kg actually paid
True amount that should have been Budgetted (million KZT)				4.310	
Actually Paid, as % Budget that should have been				60,0%	

Source: Close analysis of MoA data, 2008.

The significance of the T 39.6/kg subsidy should not be. Table B.3 illustrates how the multiplying effect of the subsidy is calculated across a large AE producing 10 000 tonnes of chicken meat per year. A fully integrated enterprise of this size can be expected to have made only a modest profit in 2008 (owing mainly to high feed prices) of something in the order of T 320 million (USD2.1 million). However, subsidies payable should have totalled nearly T 400 million (USD2.6 million).

Poultry breeder farm subsidies: For the poultry meat sub-sector, the key subsidy figures are:

- T 322 per day-old chick (DOC);
- T 40 per egg for hatching broilers;
- T 60 per egg for hatching parent stock.

The same point as for the breeder farm subsidies is illustrated in Table B.3, in which the multiplying effect is calculated across a large breeder enterprise supplying DOCs, the eggs for hatching these chicks, or the eggs for hatching parent stock to then hatch these chicks in the next generation – all leading to the production of 10 000 tonnes of chicken meat per year. However, it should be noted that breeders cannot receive more than one of these categories of subsidy, and that the common scenario is for large broiler enterprises to be fully integrated with breeder operations. Breeder subsidies are not applicable to vertically integrated enterprises, as they should be receiving the meat production subsidies.

As an example of the value of these subsidies to producers purchasing stock through the breeding companies, or claiming the subsidies through their own specialist breeder farms, sales of fertile eggs from the LLP Astana Kus company were approximately 700 000 units in 2008, which at T 40/egg should have amounted to T 28 million (USD187 000).

The following is a comparison of the production costs for each unit with the value of the subsidies, based on data from a large integrated enterprise during 2008:

● Broiler DOC:	production cost = T 61	subsidy = T 322
● Egg for hatching broiler:	production cost = T 32	subsidy = T 40
● Egg for hatching parent stock:	import cost = T 710 including duties	subsidy = T 60

It is clear that there are anomalies in these data, the reasons for which are not clear. Nevertheless, the subsidies have attracted much interest across the industry, and some enterprises have attempted to segregate breeder activities or enter partnership arrangements with third-party specialist breeder farms in such a way as to derive benefits from the breeder subsidy scheme. The scheme is also accessible to smallholder breeder operations, provided they can demonstrate the required level of commercial orientation to the Department of Taxation.

Table B.3: Calculation of subsidies payable to a 10 000 tonne/year chicken production unit, with alternative scenarios for different types of breeder operations

VALUE OF SUBSIDIES, based on 2008 allocations & actually paid		
A.)	FULLY INTEGRATED ENTERPRISES	
	Processed Meat	
	66	KZT/kg meat is set subsidy figure
	39,6	KZT/kg meat actually paid to industry in 2008
	396.294.028	KZT payable per 10,000 Tonnes
	2.641.960	***USD payable per 10,000 Tonnes***
or		
B.)	INDEPENDENT BREEDER FARMS	
	Day Old Chicks	
	322	KZT/DOC
	5.000.000	broilers/10,000 Tonnes
	1.610.000.000	KZT/yr
or	***10.733.333***	***USD payable per 10,000 Tonnes***
	Eggs for Broilers	
	40	KZT/egg
	5.000.000	broilers/10,000 Tonnes
	6.097.561	eggs needed at 82% hatchability
	243.902.439	KZT/yr
or	***1.626.016***	***USD payable per 10,000 Tonnes***
	Eggs for Parent Stock	
	60	KZT/egg
	50.000	breeders (inc males)/10,000 Tonnes
	58.824	eggs needed at 85% hatchability
	3.529.412	KZT/yr
	23.529	***USD payable per 10,000 Tonnes***

Indirect production subsidies (on feed use): Indirect subsidies to producers are made available through various subsidy schemes for grain growers. Other subsidies are provided to suppliers of fuel, fertilizer and chemicals for farming purposes:

- Grain subsidies: To encourage the increased use of reduced tillage among grain growers, MoA offers a higher direct subsidy for no-tillage wheat (up to T 900/ha) than for conventional-tillage wheat (approximately T 450/ha). Working on an average wheat yield of 1.19 tonnes/ha in 2009, these subsidies equate to T 756 T/tonne for no-tillage and T 378/tonne for conventional. At wheat prices of approx T 18 000/tonne, these subsidies are minimal. However, MoA plans to increase government subsidies for herbicides and pesticides.
- Fuel and fertilizer subsidies: Government support for agriculture has been increasing significantly over the past five years, in the form of subsidized prices for fuel, seed, fertilizer and agricultural chemicals. The government reduces the price that enterprises pay for mineral fertilizer by 40 percent, not through direct subsidies to farmers but through subsidies to fertilizer producers.
- Fertilizer application rates are gradually increasing, but still stand at only a fraction of the amount applied during the Soviet era. Kazakhstan's use of agricultural fertilizers is extremely low in comparison with world averages. Usages in 1990 to 1992 were 13.3 kg/ha, and in 2000 to 2002 only 2.3 kg/ha. These figures compare with worldwide averages for these years of 92.5 kg and 102 kg/ha respectively.17 Related to this, average grain yields in Kazakhstan in 2009 were 1.26 tonnes/ha, with wheat yielding only 1.19 tonnes/ha.
- Fuel prices are subsidized by a similar percentage and in a similar manner to fertilizer prices (i.e., through payments to fuel suppliers, rather than direct subsidies to farms). MoA sources indicate that the government allocated T 84 billion (about USD560 million) to support the 2009 sowing and harvest campaigns.

17.- World Bank/FAO. 2003. World agricultural inputs. Washington, DC, and Rome.

- The State also provides support to *research* facilities, paying 40 percent of the research and development costs for breeder and foundation *seed*. Most enterprises use only first-reproduction seed (similar to certified seed in the United States of America) or higher-quality elite seed.

Regulatory framework: The Agricultural Competitiveness Project (ACP) supported by the World Bank has achieved good recent progress in harmonizing various animal health and food safety standards, with agreements on sanitary and phytosanitary standards (SPS), technical barriers to trade (TBT) and other World Trade Organization (WTO) requirements. This project has developed seven new technical regulations, of which four are already approved by Government of Kazakhstan resolutions.

Tariffs: Kazakhstan currently maintains bilateral free trade agreements with all Commonwealth of Independent States (CIS) countries except Turkmenistan. However, the formation of a Customs Union (CU)[18] with the Russian Federation and Belarus will introduce significant changes for international trading arrangements in the three countries concerned. For Kazakhstan's poultry meat sector, the introduction of a new tariff quota system under CU rules could signal the commencement of a new regulatory framework protecting the sector from imports and, ultimately, leading to greater profitability for the industry. It could significantly retard the flow of imported chicken into Kazakhstan from non-CU member nations. On the other hand, import substitution of domestic product by Russian chicken is a serious threat for Kazakhstan.

For imported veterinary pharmaceuticals, the tariffs under CU regulations are:

- veterinary vaccines: 15 percent;
- veterinary antibiotics: 15 percent;
- vitamins and feed supplements: 10 to 15 percent.

For Kazakhstan, formation of the CU could provide an opportunity for following the Russian model and improving its current 60:40 import to domestic production ratio in the not too distant future.

18.- www.tsouz.ru/db/ettr/tnved/pages/default.aspx and www.customs.kz/exec/stat/stat?tip=13.

Pou try sector trends in the Russian Federation

The Russian poultry meat industry was in a similar position to the Kazakh industry only four years ago, with a very high proportion of imported products on the market. Largely as a result of a system of tariff quotas (together with improved genetics and feeding), the industry now produces approximately 75 percent of its domestic poultry meat requirements, with only 25 percent being imported. According to a January 2010 statement by the head of the Association of Russian Poultry Market Operators, the Russian poultry meat industry is currently increasing at 15 to 16 percent per year. The industry expects to be able to support itself within the next four to five years (Kokkonen, D: Daily Media Monitoring for MHP. Company e-mail service, Monday 18 January 2010).

The CU will result in internal trading tariffs being removed from trade flows among the three member nations. Costs of production in the Russian Federation are currently well below those in Kazakhstan, so it is unlikely that Kazakhstan will supply products to the Russian Federation in the foreseeable future. At the same time, there appear to be strong opportunities for non-tariff Russian products (and possibly also chicken from Belarus) to increase their market penetration in Kazakhstan.

MoA has strongly supported the domestic poultry industry by increasing import tariffs on broiler meat over recent years, from 10 percent of landed product in 2006 to 20 percent (and no less than EUR 0.40/kg) since 1 January 2008. Tariffs in 2009 were as follows:

Group 0207 (poultry meat and edible meat offal, fresh, chilled or frozen):

- 20 percent and not less than EUR 0.40/kg.
- EUR 0.40/kg is usually the higher amount and equates to T 81 or USD0.54/kg on landed product.

Tariffs on imported commodities:

- soybeans: 5 percent;
- soybean flour: 5 percent;
- soybean meal (SBM): 5 percent;
- fishmeal: 5 percent.

With commencement of the CU, the following quotas, set by the Customs Commission of the CU on 1 December 2009, apply to external countries supplying CU countries. These apply to all other countries, even those in the CIS (including Ukraine, which is a "*de facto* participating" nation, but not an official CIS member):

Group 0207 (poultry meat and edible meat offal, fresh, chilled or frozen):

- 110 000 tonnes for Kazakhstan;
- 780 000 tonnes for the Russian Federation.

Import tariffs under the CU are as follows:

Group 0207 (poultry meat and edible meat offal, fresh, chilled or frozen):

- poultry meat under the tariff quota: 25 percent, and no less than EUR 0.20/kg; EUR 0.20 is usually the higher amount, and equates to T 41.7 or USD0.29/kg on landed product;
- poultry meat over the tariff quota: 80 percent, and no less than EUR 0.70/kg. EUR 0.70 is usually the higher amount, and equates to T 146 or USD1.01/kg on landed product.

Tariffs on imported commodities:

- soybeans: no quota expected, no tariff;
- fishmeal: no quota expected, no tariff;
- SBM: no quota expected, tariff 5 percent.

Non-tariff barriers: Protection of the domestic poultry industry through fiscal or physical means such as the imposition of duties or tariff quotas is not the only means of preventing the entry of undesired imports under WTO[19] or other international trade agreements. Claims of inadequate food safety protocols in exporting countries, or the detection of food contaminant on arrival are forms of "biological" or non-tariff barrier protection mechanisms for domestic industries. These mechanisms generally relate to veterinary and public health regulations.

19.- MoA has an important role in Kazakhstan's agricultural industries by facilitating appropriate tariff protection of domestic markets and access to international markets in the context of WTO negotiations. Although current poultry meat exports are very low, there may be some potential for niche, high-value cooked chicken products in certain markets, and for well-presented chilled products air-freighted into the regional markets of other CIS countries. In June 2009, Kazakhstan suspended talks on membership of the WTO and announced that it will seek WTO membership together with the Russian Federation and Belarus as a single CU. Negotiations to join WTO as a trilateral customs bloc were expected to start in early 2010. MoA needs to take an active stance, alongside the equivalent ministries in the other two CU member nations, in determining appropriate tariff policies to protect the local poultry meat industry while expanding export potential following WTO accession.

Land Code: Under the Land Code,[20] agricultural land may be rented or bought as private property. Land is equivalent to capital and can be used as collateral with financing institutions. If the land is not utilized for agricultural purposes for more than a year it can be confiscated. Agricultural organizations benefit from taxation preferences.

Taxes: An overview of agricultural taxation in Kazakhstan is given in Annex 3. A single land tax applies to farmers: tax rates vary from 0.1 to 0.5 percent of the land's cadastre value, depending on the size of the holding. "Pure" farmers (rather than companies) do not pay VAT, income tax, tax on transport facilities and real estate tax. Pedigree breeding enterprises are granted a favourable tax regime.[21] A zero customs duty[22] provision is used to stimulate exports of processed wool (tops, yarn, clothes), but complex and lengthy bureaucratic procedures are required, adding to transaction costs; a 10 percent customs duty is applied to raw wool for export. Registered PFs, commercial farms and cooperatives (legal entities) receive an 80 percent deduction on all taxes, including income/corporate tax and VAT, on the basis of a patent. Informal farms are obliged to pay at least a unified land tax (although they can obtain a patent). Since 2007, processing enterprises have also benefited from a 70 percent deduction on VAT.

As agriculture producers, poultry producers in Kazakhstan have enjoyed a favourable tax regime over recent years. All taxes, including corporate income tax, VAT, land tax, property tax, vehicle and environmental taxes, were reduced by 80 percent in 2008 and by 70 percent in 2009 for commercial producers. However, to qualify for tax relief, producers must demonstrate that they have a continuous system of production in place, from growing phases through to slaughter and processing. Unfortunately, this stipulation rules out many HHFs and smallholder poultry farmers. Other conditions for tax relief or other forms of strategic funding for commercial poultry enterprises include a special tax regime defined by Article 448 of the Tax Code of Kazakhstan, paragraph 2.3, which requires that a corporate entity must possess no more than 25 percent of the legal

20.- Land Code of the Republic of Kazakhstan, 2003.

21.- Pedigree breeding law of the Republic of Kazakhstan, 1998.

22.- Government Resolution About Customs Tariff and Commodity List of External Trading of the Republic of Kazakhstan, 2007.

entity of the enterprise, meaning that 75 percent of the equity must be held by private individuals.

Artificial insemination (AI) services (see section C) are provided by the National Centre for Livestock Breeding Asyl Tulik, 90 percent of which is State-owned and 10 percent private. Semen is distributed through private agents. The inseminator (veterinarian) may apply oestrus synchronization techniques to reduce transportation costs. Agents have some flexibility in negotiating prices. The target price for a series of inseminations for one confirmed pregnancy is T 1 300 to 1 400, of which T 400 is for the semen (the cost of one to four doses plus transportation). There is also a subsidy, which varies by *oblast*; in Almaty *oblast* it is T 1 000. Small farmers can apply to local authorities to obtain this benefit, depending on budget availability. It is reported that the budget in some *oblasts* has not been sufficient to cover all requests. It appears that small farmers have reasonable access to these services unless they live in remote villages. The vast majority (99 percent) of inseminations, about 300 000/year, are with Holstein semen.

The veterinary department organizes obligatory *vaccinations*, but leaves other veterinary care to privately established veterinarians (see section F).

Kaz-Agro-Innovation (KAI, a subsidiary of Kaz-Agro Holding) is charged with *agricultural research and dissemination*. KAI is organized as a joint stock company (JSC), but depends on government funding. The research wing is constituted by the Applied Science Department, which has five divisions. The livestock division covers animal breeding, veterinary sciences and animal nutrition.

The department has a number of subsidiaries, including the Livestock Research Institute in Almaty.[23] All applied research work is conducted on private farms because the research institutes do not have their own land. Trials on the supplementary feeding of livestock on pasture have focused on feeding phosphates. The Almaty institute has been functioning for a

23.- Recent publications by the Kazakhstan Scientific Research Institute of Livestock and Fodder Production (all published in 2009) include: *Principles of breeding and effective management of merino sheep growing in a desert zone; Improvement of feeding of Karakul sheep on the basis of differential norms of protein nutrition; and Scientific bases of improving biotechnological methods of receipt, cryo-preservation and use of gametes and embryos for rapid reproduction of sheep and goats.*

considerable time, but has limited resources. It has a nutrition laboratory, but this has not applied for certification and currently does not provide laboratory services to the animal feeding sector.

The institute has created and tested four types and 18 lines of farm animals, and one breed of domestic ducks; and developed 23 technologies for feeding farm animals, birds and fish to ensure higher productivity compared with traditional technologies. In the veterinary field, 24 health care products, including 13 vaccines, five diagnostics and six therapies, have been developed.

MoA discontinued research on pork for policy reasons, based on the argument that this sector was self-sufficient.

Inspiring research topics are being proposed for international collaborative research and development work. Projects are selected by a group of independent international experts at least once a year. Provisional topics are listed in Table B.4.

Table B.4: Proposed international collaborative research and development work

Meat and milk

- Design of new small and medium-sized plants for primary processing of livestock products in rural areas
- Production technologies to influence chemical composition (for protein, fat, moisture, etc.)
- Design technology for multi-component food mixtures
- Development of combined cereal and meat in next-generation products
- Development of special-purpose foods (for children, etc)
- Development of methods for assessing the quality, safety and adequacy of raw materials and finished products
- Technologies for packaging food with polymer materials for long-term storage

Animal husbandry and veterinary

- Methods of genomic fingerprinting
- Technology for early diagnosis of pregnancy in cows and heifers
- Production of beef with maximum use of natural pastures, coupled with intensive fattening
- Use of specific marker genes for improving qualitative traits, including shell strength
- Introduction and adaptation of the best foreign genetic material for poultry
- Equipment and computer programs for the animal identification of birds
- Delivery and use of interbreeding and cross-breeding imported sheep
- Innovation of forage harvesting for hay and silage using round bales and wrapping
- Improving the reliability of existing feed equipment
- New feed milling processes, such as batching, mixing, granulation, input of liquids, extrusion, etc.
- Technology for processing rice waste in combined feed for livestock and poultry
- Mapping and assessment of natural forage lands and monitoring the dynamics of their productivity
- Development of a pasture inventory
- Creation of a databank on agroforestry and conservation lands
- Improving zonal systems for fodder production
- Development of biological technology for recuperation of salinized irrigated lands
- Development of adaptive and effective technology for using arid grazing lands
- Development of seed production zones of perennial grasses
- Creation of pilot production models for the training of professionals and managers

It is envisaged that financing will be raised by selling licences for technologies that first have to be purchased from abroad. The Centre for Transfer and Commercialization of Agricultural Technologies, established within KAI, is responsible for: i) intellectual property transactions; and ii) placing technologies on the market through the creation of innovative

companies. It is planned that private sector funding will be attracted for spin-off companies. Research results are compiled and published on the Web site[24].

KAI is gradually establishing an outreach network at the regional and district levels, and the functional management structure being proposed shows a viable demand and supply flow system for services, which reflects all levels of stakeholder. A cadre of trained human resources has been formed. With MoA support, KAI has established training centres attached to the main research institutes, where farmers follow knowledge-building courses. The Southern Training Centre is in Koldi (Alamaty *oblast*), the Northern Training Centre in Shorthandy (Akmola *oblast*) and the Northwestern Training Centre in Zarechny (Kostanai *oblast*). Another centre has been organized in Tassai, near Shymkent within the South Western Research Centre. In 2009, KAI had a budget of T 60 million to train 1 300 farmers through 65 five-day courses. However, KAI is not yet in a position to engage with smallholder PFs or to support extension work for about 2 million HHFs in villages. With support from the World Bank-assisted ACP, KAI is upgrading the training centres into centres for knowledge dissemination (CKDs) attached to research institutes in each region (*oblast*). KAI is carrying out needs assessments to identify farmers' demands for extension/training/advisory services. Information and communication technology (ICT) infrastructure is being upgraded, and on-line advisory services are soon expected to be operating through a unified call-centre system.

Rural (agricultural) service centres are being envisaged**.** The First Vice-Prime Minister instructed the government to prepare a bill on the establishment in Kazakhstan of service-purchasing centres (SZTSs) in all regions, similar to the one already operated by the national JSC SEC Ontustyk of Kazakhstan. This decision was based on the findings of a workshop in Turkestan on Creating Service-Purchasing Centres based on the Cooperation of Agricultural Producers. It was reported that Ontustyk Kazakhstan SZTS was providing services for production, storage, crop sales and marketing for agricultural producers. In 2008/2009, it purchased

24.- www.agroinnovations.kz

376 units of agricultural machinery and equipment valued at T 1.7 billion. The agronomic services the SZTS provided to farms were valued at T 168.3 million.

The new SZTSs would be located in each of the 31 district centres of three southern *oblasts*, depending on the capacity of each area. A condition for the creation of an SZTS is the participation of rural consumer cooperatives in its authorized capital. The target is to create 36 SZTSs, with a total investment volume of T 7.2 billion, between 2008 and 2011.[25]

Standardization and certification: Pedigree centres are certified by a special commission of scientists and representatives at the *akimat* level. Wool production and processing is regulated by international and national standards; the latter are developed by the Kazakh Institute of Standardization and Certification. Most procedures for sheep breeding, classing, testing and processing are defined in Soviet and current GOSTs adopted by the former Soviet Union and current CIS countries. Compliance matters are carried out at laboratories accredited by the National Centre of Accreditation, a limited liability partnership (LLP). The Institute of Sheep Breeding (Mynbaevo), JSC Kazruno (Semey), LLP Alrun (Almaty), LLP POSH-Taraz, JSC Kargaly and a few others have laboratories for wool testing. Sheep and greasy wool trading are also subject to veterinary supervision and certification, which are essential but currently ineffective owing to widespread unofficial trading.

Market information and marketing: Kaz-Agro-Marketing (KAM) provides weekly bulletins of regional prices for commodities, which are also available on the Internet. These are based on aggregates from the data collected by a large circle of correspondents. The sector uses this information as an indicator. In addition, KAM has undertaken surveys and analysis concerning: i) the markets for beef, poultry and pork; ii) formulation of the prices for meat supplied to the markets in Astana; and iii) the condition of some sectors of the agro-industrial complex of Kazakhstan.

The Mal Onimderi State Company (MOC) was set up to support marketing where the private sector is underperforming. Its aims were to

25.- *Kazakhstan Today*, Shymkent, 20 August 2009.

stimulate livestock production, to stabilize and strengthen domestic markets for livestock products, and to develop export markets. It is a dual-purpose entity including a commercial structure for the brokering function in livestock market development. MOC has been involved in feedlot establishment for meat, and has had substantial involvement in milk and wool marketing. In 2008, through a network of procurement stations owned by the company, MOC intervened in the wool market to sustain market prices and sheep owners' income by purchasing greasy fine wool at USD1.66/kg (18 percent more than actual market price). It bought 1 729 tonnes of wool, of which 1 189 tonnes was sent for processing (into 592.1 tonnes of scoured wool). Coarse wool (173.4 tonnes) was used to produce 38 500 pairs of felt boots. A small portion of scoured coarse wool was exported to the Russian Federation. MOC is working to identify and negotiate direct international market outlets (mainly in China). The company intends to acquire public funds for the advanced procurement of fine wool.[26]

Supply of mechanization services: This essential service used to be provided to small- and medium-scale farmers.[27] However, the present machinery park is in a precarious state of repair, and many technicians have discontinued this profession and sought work outside rural areas.

Accounting services: To obtain access to credit, farms need to keep accounts. Where small- and medium-scale farmers do not do this themselves, professional accounting services are an essential element in rural infrastructure. This is lacking at the moment.

26.- According to interviews with MOC high-level managers. However, MOC's overall performance has not been satisfactory. It may be advisable for the company to reorganize itself and focus only on the role of marketing agent and service centre dealing with: i) advertising investment opportunities in both the domestic and the international markets, specifically by attracting investors in wool processing; ii) facilitating relationships between Kazakh and international market players; iii) information and knowledge management; iv) sales promotion on international markets, through the Internet, stands at fairs and exhibitions, brochures distributed to market players, etc.; v) export guarantee schemes; and vi) training of trading operators in areas of international legislation and procurement regulations.

27.- In Western Europe, where the average size of a family-owned dairy farm varies from about 60 to 100 cows, a large majority of mechanized fieldwork (e.g., forage harvesting, maize planting, manure spreading) is carried out by specialized contractors who have the expertise and facilities to operate heavy equipment and can use it efficiently on many farms.

Financing:[28] Agricultural credit is provided by three governmental agencies, all parts of Kaz-Agro Holding, which has equity financing from the government: Kaz-Agro-Finance (KAF) finances mainly equipment and to a limited extent livestock; the Food Contract Corporation (FCC) finances seasonal loans for the grains sector; and the Agro Credit Corporation (ACC) is engaged in the baseline financing of cooperatives (including companies that are cooperatives in name only).

KAF leases out equipment and provides credit. Average terms of financing are: duration ten years; interest rate 4 to 12.5 percent per year; grace period up to two years; and upfront payment of 25 to 28 percent of the equipment price. KAF employs innovative methods of financing by reducing the capital requirements of borrowers through leasing arrangements. A standard product entails a down-payment of 15 percent and a bank guarantee for the first year and for coverage of second year loan charges, the remaining exposure being covered by the value of the leased object. This arrangement has also been applied for cattle. Another successful venture has been the financing of soybean farms through an oil extraction company. Interest rates are a modest 2 to 7 percent, depending on the purpose of the loan. KAF reports repayment rates of 99.9 percent and high credit ratings.

In 2009, KAF financed 18 projects, with values ranging from T 132 million to 4 564 million, but small- and medium-scale farmers do not use KAF credit. There have been no efforts to address the small farm sector, and small farmers still lack the skills and resources to obtain access to credit. However, PFs constitute a potential target for financing. They have accumulated capital in the form of their growing livestock herds, and might be able to move to higher farm efficiency with a reasonable level of credit.

ACC has three main activities:

(1) a system of credit cooperatives: since inception, 158 cooperatives have been served with KZT 56.1 billion in loans at 8.9 percent annual interest (4 percent for ACC's margin, and 4 to 5 percent for credit cooperatives);

28.- **Kaz-Agro**, http://nhkazagro.kz/jo/index.php?lang=kazakh; **ACC**, www.agrocredit.kz/; **KAF**, www.kaf.kz.

(2) associations for joint production, harvesting and marketing: since inception 122 associations have been served with KZT 7.6 billion in loans at 5 percent annual interest;

(3) provision of credit to non-agricultural business activities in rural areas: in 2008, 58 units were served with T 1.1 billion in loans at 9.5 percent annual interest.

ACC's future plans include:

(1) building a network of credit associations by converting its own branches;

(2) financing export-oriented production (such as the feedlots discussed previously).

Many "credit cooperatives" are in fact AEs. Associations comprise small farms, including HHFs, and have a total of more than 4 000 members. Credit to private rural entrepreneurs specifically excludes entrepreneurs in agricultural services, owing to a perception that associations can avoid the need of intermediaries and serve the farmers' interests better. In practice, however, competitive private entrepreneurs often do better and are more dynamic than associations. Overall, the number and amounts of loans remain small. A fully deployed agricultural credit system should be able to process and supervise tens of thousands rather than hundreds. Further investigation should be directed towards whether the proposed network could help increase organizational capacity.

In the sheep wool sector, ACC is open to members of rural credit associations, with loans of one to seven years at annual interest rates of up to 9 percent; to rural consumer cooperatives buying special equipment and machines, with loans of seven years at 5 percent interest; and to non-agricultural activities in villages, with loans of five years at 9.5 percent interest. ACC received 30 investment project applications for pure-bred fine wool sheep purchasing and one project for wool procurement (all under consideration for funding). A special line of credit and leasing is available for investment projects in the fine wool production and processing segment. These loans are for seven years, at annual interest of 6 percent. All regions that traditionally specialize in fine wool production are given

priority: Almaty, East Kazakhstan, Zhambyl and South Kazakhstan. Base requirements include ownership of at least 600 fine sheep and 500 ha of hayfields and pastureland. Related to ACC, Samruk-Kazyna sponsors a special programme for financing fine sheep breeding cooperatives in the south, particularly those using Australian merino.

The JSC Fund for Agriculture Support provides micro-credit of up to USD2 700 to rural dwellers, for up to two years. Financing is also possible through other financial institutes, such as the JSCs Investment Fund of Kazakhstan, Bank of Development of Kazakhstan and its subsidiaries KDB-Leasing, and DAMU Fund of Entrepreneurship.

Investment projects implemented in the wool industry include the following:

(a) 2004: JSC Investment Fund of Kazakhstan bought a 49 percent stock share of JSC KazRuno. Investments were directed to the purchase of Chinese equipment for wool primary treatment (WPT).

(b) 2006: JSC KBD-Leasing funded the LLP ZavaST project for the construction of a knitwear workshop (EUR 2.7 million).

(c) 2007: Rural consumer cooperative Biyazi (Shymkent) received a USD1 million credit line for the construction of a WPT plant (JSC ACC).

(d) 2009: LLP Taraz-POSH (Taraz) received USD6.3 million to purchase equipment for tops production (JSC ACC).

Government bank loan rates (such as from JSC Development Bank of Kazakhstan) for the poultry sector have recently been in the order of 15 percent, while loans provided by JSC KAF through budgetary funds are currently about 8 to 9 percent.

C

STATUS OF TECHNOLOGY IN LIVESTOCK PRODUCTION

The technology status of farms in Kazakhstan varies, with very basic technologies being used at the HHF level. In the large-scale farming sector, technologies are more advanced, but most farms still lag behind international standards. This results in modest animal productivity parameters and large inputs of labour. Some of the new dairy farms may be exceptions.

In particular, HHFs follow a low-risk strategy based on the use of cheap but low-quality feed, rather than on increasing productivity with high-quality feed. Although such conservative strategies leave much of the production potential unused, they might be appropriate. The following are examples of sub-optimal technologies:

- For forage cutting, finger mowers are commonly used instead of the more efficient disc mowers.
- Manure from HHFs is often not returned to the land but burned, leading to depletion of soil fertility and gradual reduction in yields from the public grazing land around villages.
- Forages receive no fertilizer and no manure.
- Hay is cut too late and is of poor quality.
- Animal rations are formulated haphazardly.
- Pigs in small farms receive unbalanced protein, which is usually only wheat bran, sometimes with some peas, but without soybean, lysine, methionin, minerals and vitamins, etc.
- Bulls and steers in feedlots receive too much poorly digestible hay.

Current productivity parameters of livestock

Table C.1 compares current productivity parameters in Kazakhstan with information on the potential for breeds of international standard. Estimates on productivity are provided in the sections on individual sub-sectors.

Table C.1: Current productivity parameters compared with breed data and international standard

Parameter	Type of farm	Animal breed	Estimated value	Value for breed under good conditions
Milk/cow/ year	Small farm, dry zone	Aulieatin, mixed	2 000 litres	Aulieatin[a] 2 700–5 000 litres
	Small farm, cropping zone	As above	2 500 litres	
	Poorly managed large dairy farm	Aulieatin	2 500–3 000 litres	
	Well-managed large dairy	Aulieatin +	(claim) 5 000–6 000 litres	
	Dairy project in Karaganda	Holstein	(claim) 9 100 litres	Holstein, 8 000–10 000 litres
				Holstein, with grazing, 7 500–9 000 litres
Cow body weight	Small farm	Aulieatin, mixed	375–400 kg	480–510 kg
Steer SW	Small farm	Aulieatin, mixed	350 kg at 2.5 years (LW)	425 kg at 19–20 months (calf hand-fed, pasture-based, winter hay, supplement and feedlot finish)
	Large farm with feedlot	Kazak White Head	430 kg at about 20 months	450 kg at 19 months (calf suckling, pasture-based, winter hay, supplement and feedlot finish)
Piglets reared/sow/ year	Small farm Medium-scale farm (100 sows) Large farm	Large White (classic)	14–16 16 19	Large White19–21 Modern top breeds 25–30
Porker age at slaughter, 110 kg	Small farm Medium-scale farm (100 sows) Large farm	Large White (classic)	365 days 290 days (110 kg) 230 days (100 kg)	172 kg (102 kg LW) Large White[b] 155 kg (115 kg LW) (for a hybrid breeding system)

Sources: [a] Ernst, L.K. and Dimitriev, N.G., 1989. *Animal genetic resources of the USSR*. FAO, Animal Production and Health Paper, n. 65; MoA. 2003.*Kazakhstan's farm animal genetic resources*. Country report to FAO. [b] Test UK, www.bpex.org.uk.

For sheep, parameters differ according to breed. Since the transition, most sheep are a mix of breeds making it difficult to assess population data with any accuracy. However, it has been noted that a type of long-wool sheep in Almaty region shows a remarkable response to a long grazing season with feeding during the short winter. These sheep lamb twice a year. Fat-tail sheep, with shorter curly wool, do not show this response, but instead store more fat. For horse enterprises, the technology status does not seem to be an issue.

Performance evaluation has to take into account the different values that meat and fat have in different markets. Fat-tail sheep fat is a highly appreciated food in the south, while the meat and fat of fine wool merino sheep are not appreciated in some areas. As a result, the market value of slaughter animals of this type can be less than that of other types of sheep. It should be noted that high productivity per animal is often not the most economic productivity level. The optimum depends on the prevailing prices and available resources.

Animal breeding situation

The Assyl-Tulik Centre was founded in 2001 to serve regional State breeding stations as part of a national animal breeding programme. The centre keeps stocks of the semen of several breeds, imports semen and embryos, harvests semen, and provides semen to private AI operators. Most inseminations (99 percent) are with Holstein semen for dairy cows. Assyl-Tulik is basically a multiplication centre and does not engage in animal breeding, other than by importing semen and embryos. The Internet prospectus of the station for dairy sires refers only to milk and fat content, and not to other traits that are important for economic performance, such as ease of calving, quality of udder and legs, longevity, etc.

In the main breeding centres, it is reported that records are kept manually because computerized systems have collapsed. KAM has been charged with setting up a new computerized animal record system for breeding purposes, including developing software.[29] KAM has also been

29.- Such software products already exist worldwide. The adaptation and use of these would allow broader international acknowledgment and support.

requested to give its opinion or agreement on proposed private imports of genetic material.

Animal breeding is central to government development polices in the livestock sector. Subsidies are presented as a major instrument for promoting pure-bred breeding. At the *oblast* level, officials in the department of agriculture have an active role in the preservation of genetic material. On the other hand, the criteria that farmers must fulfil to qualify for subsidies scarcely refer to their breeding work, and do not cover all the activities of private breeders.[30] Animal breeding involves three main issues: the breeding work itself, the role of government in animal breeding, and priorities for the wider animal production sector.

Work on the genetic improvement of breeds through selection is important, but it should not obscure the wider goal of reviving the livestock sector. In the short term, there is need for programmes that promote the best use of existing breeds through multiplication, on-farm evaluation of the breeds' on-site performance, information dissemination, and better nutrition. Attention to animal breeding and animal performance creates a stimulating environment for livestock farmers, but the farmers then need to be fully engaged in breeding work through participation in shows, breeding clubs and so on. The government can assist and stimulate by, for example, providing a technical centre for data processing until private associations are able to take over.

Cattle. Valuable local breeds of beef cattle exist; the most important are the synthetic breeds Kazakh White Head (with local and Hereford blood) and Aulieatin (based on a local breed crossed with Aberdeen Angus and Charolais). The number of basic pure-bred stock has dwindled.

It is important to preserve existing breeds, notably the Kazak White Head and the Aulieatin, and to select good bulls from these to harvest semen. This requires a bull testing scheme. With beef cattle, unlike dairy cattle, it is not necessary to conduct complicated progeny testing with large numbers of offspring. Instead, the performance of the bulls themselves can be measured. This should be done in representative circumstances and in a

30.- In 2008, the Dinara Ranch imported a herd of 253 Hereford cattle from Texas, United States of America.

careful manner, to minimize the influence of environmental effects. Growth performance data should be collected, along with visually assigned scores for the animals, and these can then be processed by statistical methods.[31] Until this is possible, a fair selection of sires can be obtained by evaluating mates of similar ages within a single farm.

Breeding farms do not need to be very large. Small stud herds of only about 20 cows can be as valuable as larger herds, but a small herd should be integrated into a network of breeders for evaluation and the exchange of material.

The task is to recreate a beef cattle population from the surviving reduced herd. When farmers are interested in increasing numbers and have the financial resources to do so, an increase in the female population of 5 to 7 percent a year is usually expected. Within about ten to 11 years, the present beef cattle herd of about 1.3 million would have grown to 2.5 million. This is satisfactory, when all structural constraints of the sector are taken into account. The dairy cattle population can also contribute to increasing the beef herd, by cross-breeding a portion of mainly HHF dairy cattle. Cross-breeding of Aulieatin black and white dairy cattle with beef bulls should give an acceptable animal for ranching (and calfing), perhaps requiring a little more care and feeding than beef breeds. The HHF owners of such cross-bred cows could lease them to herders/ranchers or put them into the care of herders. If HHFs used a beef bull on only 5 percent of their cows for about five to six years, they would double the growth of the beef herd. There is therefore no biological constraint to the rapid recreation of a large herd of beef cattle.

Dairy and dual-purpose cattle: Dairy cattle breeding should take the needs of different kinds of farms into account. Farms with top-class management can use Holsteins, but selection should still be based on the animals' resilience, as well as their milk yields. In Europe and elsewhere there is an increasing awareness that Holstein cattle have become very vulnerable. The current trend is not to breed for high lactation yields but for high lifetime yields per cow. This is achieved by building indices that consider multiple parameters collected from the progeny of sires. This

31.- For instance, the methods developed by FAO in Uganda, Botswana and Swaziland.

kind of breeding is done internationally with large populations of more than 1 million cows, permitting a high degree of statistical precision. It is therefore not recommended that such a breeding scheme be started immediately in Kazakhstan, unless it is done jointly with, for example, the Russian Federation and other CIS countries. What is necessary, however, is that buyers and herd owners are trained to evaluate the specifications of the sires that are available on the international market. The organization Interbull helps by taking care of the international compatibly of breeding data; the international market for semen is very competitive. International users often pay less than half as much for semen as the members of associations in the bulls' home country do.[32] Proper selection of imported semen can be complemented with the record system referred to previously, not as a main selection tool but to monitor the performance of imported semen, thereby serving as a tool for training and helping farmers to select the best of their own cows for breeding.

Farms in villages would be advised to use the Aulieatin breed. It has a potential yield of 5 000 to 6 000 litres of milk per year. The current practice of distributing Holstein semen may be harmful. It is reported that less than half the potential of the Aulieatin is currently utilized. The Aulieatin or Alia Ata is a hardy animal with excellent legs and feet and can withstand being tied in the stable for most of its life. The Aulieatin also has a better body conformation for beef production than Holsteins, which are essentially empty frames with large stomachs and a large udder. Unlike Holstein semen, there is no competitive international market for Aulieatin semen, and the Aulieatin is disappearing from private large-scale farms, which are switching to Holstein. It is also unlikely that a breeding association of PFs will emerge in the near future. There is therefore a need to engage private farms that are interested in continuing to breed the Aulieatin. Agreements should include assurances of appropriate breeding work (a full recording system, the use of test bulls on 30 percent of the cows, scoring of animals, delivery of all data for statistical processing, etc.).

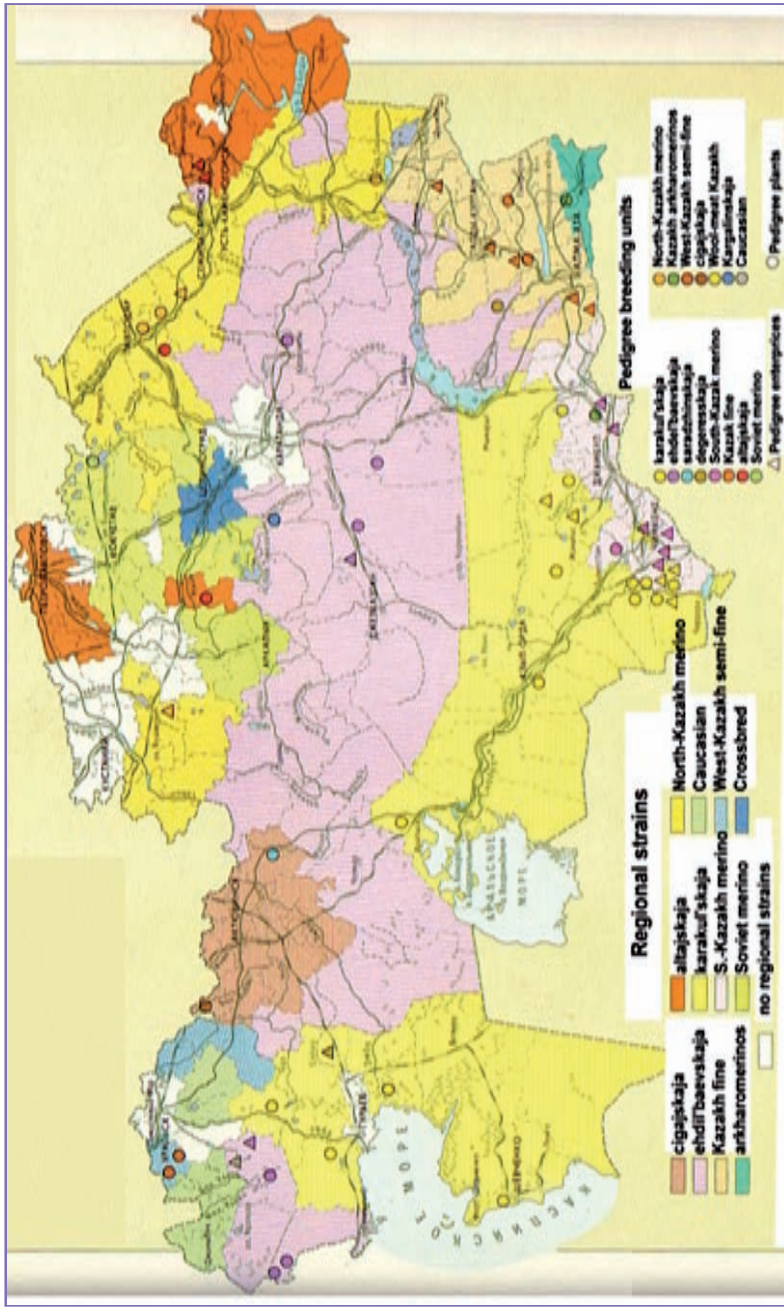
32.- This is because the breeding associations gain extra income by exporting surplus product. The costs are in the testing of bulls; once a bull has been approved, it costs little to harvest extra semen.

Sheep breeding

Farmers are mixing sheep breeds. A possible solution would be to wait and see which meat sheep owners continue to breed. Eventually, new regional breeds would emerge. To retain flexibility and for future use, government breeding farms (or contract private farms) could maintain breeds that were developed in the past.

Kazakhstan has been registering pure-bred fine and semi-fine wool sheep breeding activities since 1970. The country had a scientifically acknowledged role in pedigree sheep farming within the Soviet Union. About 20 sheep strains were bred in different regions of Kazakhstan, including fine wool sheep strains (Kazakh fine, Archaromerinos, South-Kazakh merino and North-Kazak merino), obtained by crossing more resistant autochthonous breeds with Australian merinos (and others) (Figure 11).

Figure 11: Distribution of pedigree sheep strains



Source: 1981. *Atlas of Kazakhstan*.

Far from the past glory, the current situation is shown in Table C.2, which includes 13 breeds (nine fine wool and four semi-fine wool). The ownership structure is shown in Figure 13.

Table C.2: Pedigree fine and semi-fine strains, 20

Sheep strain	Head	% of total
Fine	179 776	100.0
Kazakh fine	81 859	45.5
South Kazakh	71 719	39.9
Kazakh arkharomerinos	8 557	4.8
North Kazakh merino	6 815	3.8
Volgogradskaiya	5 377	3.0
Altay	4 125	2.3
Australian merino	1 067	0.6
Soviet merino	235	0.1
Caucasian	22	0.0
Semi-fine	27 384	100.0
Cigaiskaya	17 789	65.0
Kazakh semi-fine	3 736	13.6
Akzairskaya meat-wool	3 238	11.8
Kazakh meat-wool	2 621	9.6

Source: Based on the Agricultural Census.

The present pedigree sheep breeding infrastructure includes the following:

(a) Sheep (and other animal) breeding research institutes and study units (belonging to MoA since 2003), including the main Kazakhstan Research Institute of Animal Breeding in Almaty: This latter consists of regional agriculture institutes dealing with sheep breeding. The most important organizations for fine wool breeding are the Sheep Breeding Research Centre in Mynbaevo (Almaty region); the Southern Sheep Breeding Research Institute in Shymkent, dealing with astrakhan sheep strains; and the Republican Centre of Pedigree Breeding (JSC Asyl Tulik in Akmola region), which has a specific fine wool sheep breeding programme.

(b) Pedigree centres and enterprises, which are agricultural units that keep pedigree stock for both meat and wool purposes and that commercialize registered pure-bred live animals to private farms: During Soviet times, AI was widely practised through a network of fully equipped insemination stations operated by qualified personnel. The bulk of these stations are no longer fully operational. In 2004, 31 wool sheep and 57 meat sheep pedigree breeding stations were registered in Kazakhstan; more than 50 percent of the wool sheep stations were in Almaty region. Although the privatization of these is foreseen by Regulation 1061 of 26 September 2002 (which restricts this activity to the private sector), the two centres and enterprises that are still operational, appear to function inefficiently as State-owned structures.

However, Kazakhstan scientists have had some successful breeding projects. In 1993, the Mynbaevo Research Institute imported merino ewes from Australia (under a special waiver, as Australian legislation does not allow the commercialization of pedigree ewes). The progeny were disseminated to local pedigree enterprises, to increase wool yield and quality parameters. This flock was maintained until 2003, when it was discontinued.

One of the main achievements is the inter-specific hybrid obtained by crossing Argali *(Ovis amon)* with merino fine wool sheep (*Ovis aries orientalis*). The new strain, archaromerinos, provides wool of 64' quality grade and is resistant to highlands and broken ground. Extra-fine (14 micron) fluff is also obtainable from these sheep.[33]

Breeding activities continue, but not at the same level as in the past. Current activities include:

(a) breeding of a fine wool strain of 60 to 64' (20.5 to 25 microns) grade, and a 3.0 to 3.5 kg scoured clips yield;

(b) breeding of a fine wool strain with 70' grade (less than 20.5 micron), by crossing Kazakh archaromerinos with wild rams (known as "archars");

33.- Reported by Bekesheva Salima (Kaz-RI).

(c) breeding of a new strain of Kazakh merino with the best local "australized" (with a high portion of Australian merino blood) fine sheep, with a shearing yield of about 3.5 to 4.0 kg of scoured wool.[34].

However, many specialized enterprises and centres have changed their breeding strategy: currently the emphasis is on increasing meat and lamb productivity. Kazakh fine sheep are crossed with Deutshe merinofleishaf and Suffolk rams. Some strains, such as North Kazak merino or Altay fine are at high risk of extinction.

The Mynbaevo Research Institute

The staff consists of 55 scientists, 15 doctors and 23 MScs. Average salary is about USD450/month (twice the local average). Financing comes from the Republican budget for pedigree breeding. Commercial activities provide 5 to 10 percent of financial inflows. The institute deals with most certified pedigree sheep breeding plants. Staff supervise outsourced breeding activities through five to six visits a year. The institute has its own laboratory with a bank of wool samples. The laboratory has standard IT equipment for wool testing, and indicates average fineness, variation and length, but does not analyse chemical properties and the strength of clips. Testing capacity is about 300 samples per day. Testing services are open to all users for about USD1 each; results are stored in a computer database.

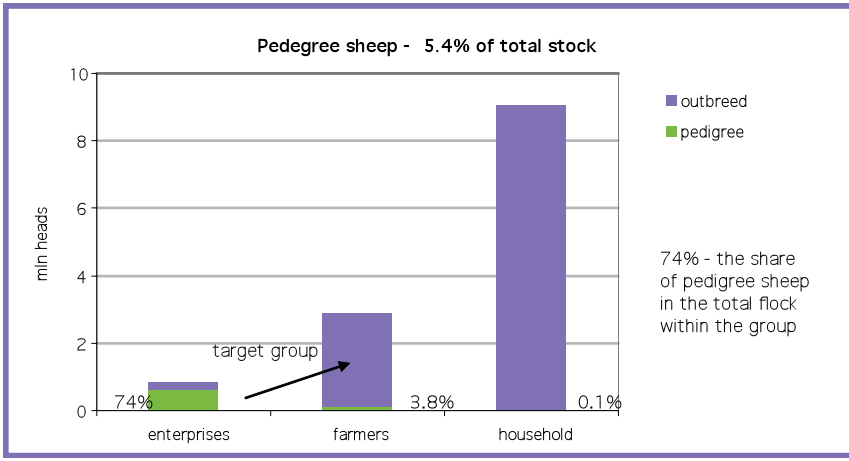
The crossing of Kazakh fine sheep strains is still considered useful for further improvements (with in increases in wool yield of 0.3 to 0.35 kg, clean wool yield ratio of 5 to 11 percent, fibre length of 1.5 cm; and strength of 14 percent). However, there have also been some declines (a slight decrease in mass of 1.1 to 2.8 kg/adult head)[35] and lamb crosses appear weaker than local strains (in terms of cold weather resistance and health). In all cases, scientific control and surveillance by research institutes is essential.

The target group for stock breed improvement with the highest chances of success are the larger expanding PFs, particularly those with 1 000 to 2 000 and more sheep (Figure 13).

34.- Breeding is carried out at the Aldabergenov Breeding Centre, and the breeding enterprises Rahat-Kurty, KH Madina, Bultbek, Alakol'-Agro, and Tau Samal in Almaty region. The total sheep population is 50 000; the new strain includes about 2 300 sheep yielding up to 3.1 kg of scoured wool per ewe.

35.- Lulina, N.I. 2006. Wool properties and histological structure of skin of Australian merino and their crosses with Kazakh fine sheep, p. 142.. Alma-Ata. (Msc. Dissertation)

Figure 12: Pedigree sheep distribution, by farm type



Source: Kazstat.

Pig breeding

Well-managed, large-scale farms are capable of using top-end genetic material. As with poultry, there are international commercial synthetic breeds for sows, such as the Hypor from Hendrix Genetics. These sows are cross-bred with an "end boar" of another breed to obtain the desired fattening and marketing characteristics. Topigs is the cooperatively owned breed of a pig breeding association,[36] whose material is distributed in 30 countries. Danish breeding material is renowned for its high fertility. These breeding systems have been developed with background populations of tens of millions of pigs, and it is recommended that Kazakhstan makes use of them. In the meantime, the Large White pig breed currently in use should be maintained, to allow small farms access to its material through contracts with a few farms. This could be supported by imports from, for example, the United Kingdom, where the Large White is still bred.

36.- Picture Group Pig Breeders Cooperative has 3 000 pig farmer members and owns 77.5 percent of Topigs. The remaining 22.5 percent is owned by the fresh meat processor Vion Food Group, www.topigs.nl/.

Poultry breeding

MoA has supported the supply of appropriate genetic lines of parent stock to broiler farms by establishing a government-owned specialist breeding company (Astana KUS) in the poultry meat industry. There is also a private parent stock breeding company (Bent-Anak), which appears to perform with higher standards than the public company. To encourage their support of breed improvement, producers are subsidized if they buy eggs for the hatching of either parent stock or broilers, or hatched DOCs, from these two companies. MoA also supports specialist commercial breeding farms that supply DOCs to broiler growing farms, by offering substantial breeder farm subsidies on eggs and DOCs. This segment of the chain requires better alignment of the production patterns and time frame of specialized breeding farms with the demand from the poultry industry.

Further efforts should be directed towards assessing the opportunities for specialist commercial breeding farms in Kazakhstan to supply the DOC requirements of smallholder poultry farmers (particularly larger PFs) in Kazakhstan or other CIS or Central Asian countries with developing poultry meat industries. However, developing bloodlines of poultry bred specifically for the conditions prevalent in Kazakhstan would be an expensive and time-consuming pursuit with very little economic benefit for the industry, and could even disadvantage the industry. The current practice of using genetically advanced breeds established by the world's leading poultry breeding companies (such as Hubbard, Ross and Cobb) should be maintained, as it is in most leading poultry production companies worldwide. The cost of importing parent stock DOCs accounts for only 2.5 percent of the total cost of goods sold, so it would be more beneficial to focus attention on improving the remaining 97.5 percent of the cost of goods sold rather than on improving the 2.5 percent. Commercial poultry breeding is a highly specialist activity and best left in the hands of the world's long-established leading poultry genetics companies.

D

THE FEED BASE

Rangelands and pastures

An overview of the current (mid-2009) position of land resources is given in Table D.1. 188 million ha is classified as rangeland (pastures). Of these 29 million ha are classified as eroded, and an estimated 40 million ha are reported to be wooded or saline.[37] The remaining 120 million ha[38] of rangeland should be useable when drinking-water for livestock is available or can be made available within a reasonable distance.

Part of the rangeland is given over to established farms and urban-based investors, which are not using the land. About 56 million ha of rangeland has been sold or is leased out, and approximately 17 million ha is qualified as commons. These are lands that are used by the population and cannot be privately owned.

Table D.1: Land classes and tenure status

Status of land as of 1 November 2008 ('000 ha)					
	Total land	Total agricultural land	Including		
			Arable land	Hayfields	Pastures
Total	272 490.2	222 485.9	23 495.0	5 022.6	188 758.9
State agricultural enterprises	1 683.3	1 479.3	177.3	17.5	1 243.9
Sold or leased					
to HHFs	390.2	319.0	212.5	2.7	53.7
to PFs	43 756.0	42 840.8	8 448.3	1 130.2	31 294.9
to AEs	43 487.4	40 832.0	13 866.6	718.4	24 925.2
Subtotal sold or leased	87 633.6	83 991.8	22 527.4	1 851.3	56 273.8
Forest resources	23 279.3	9 096.3	87.0	260.2	8 738.1
Reserve lands	114 827.0	97 571.1	586.6	2 325.9	92 997.6

Source: Statistics Agency.

37.- Schillhorn van Veen, T.W. 2004. *Rangelands in transition*. Technical Paper No. 31384. Washington, DC, World Bank.

38.- There may be some overlap between saline and arid lands.

Pastureland areas included in reserve land incorporate the very substantial areas of desert, eroded or saline areas that are of no interest for livestock production. As noted previously, AEs and PFs jointly own about 1 million cattle and 5 million sheep and goats. This is equivalent to about 1.2 million livestock units (LSU). The 56 million ha of pastureland that has been leased or sold is far more than this herd requires; about 10 million to 20 million ha would be sufficient. There is therefore ample opportunity for the holders of land titles to invest in ranching.

The management of land is delegated to *rayon* (district) administrations. Range property or lease boundaries are not fenced or marked. Landowners and leaseholders cannot easily control their land's use by third parties, but in the case of mountain grazing by communities, there is effective social control that prevents outsiders (from other regions) from using the land. Therefore, if the holders of land titles wish to play an effective role in the utilization of the land, they need to seek the collaboration of local communities.

The overall estimated yield of the pasture resource base is about 25 million to 30 million fodder units a year,[39] but Kazakhstan's pastures vary greatly in terms of natural productivity (Figure 12):

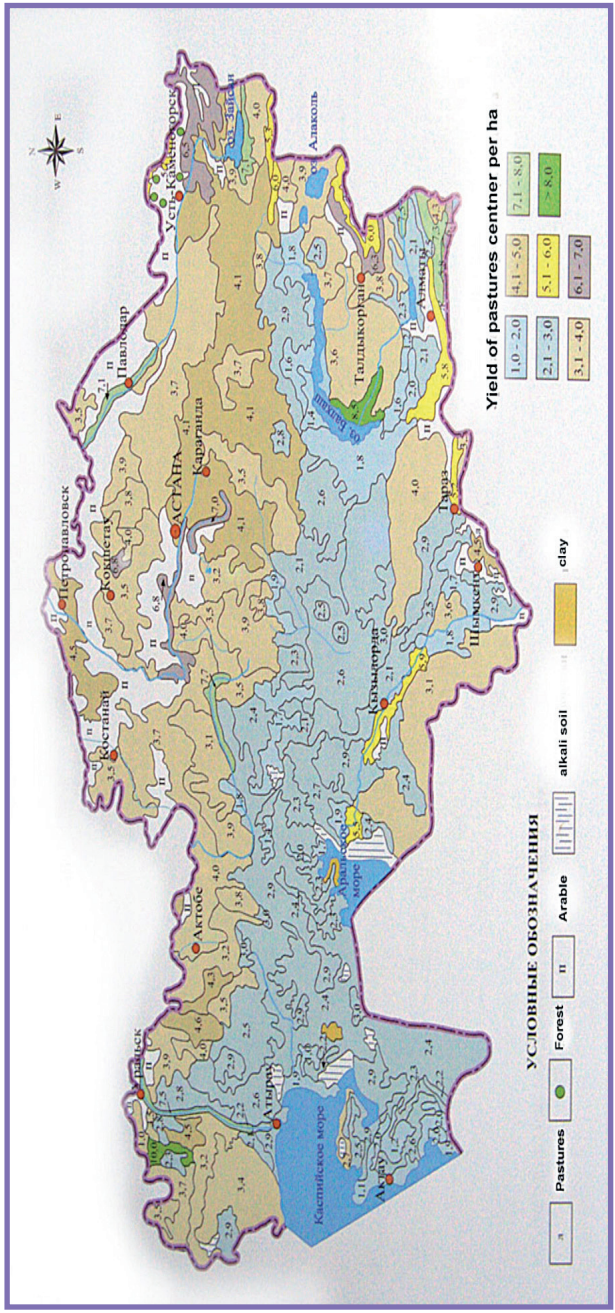
(a) In semi-desert and desert areas (centre, west) productivity varies from 20 kg to 0.3 tonnes of dry mass per hectare.

(b) In sub-mountain steppe zones (south, east) it averages about 0.5 to 0.7 tonnes/ha.

(c) In sub-alpine zones (up to 1 800 m above sea level) it reaches 3 to 7 tonnes/ha.

39-. Torehanov, A. and Alimaev, P. 2004. Potential for animal grazing and effective feed base utilization in different zones of Kazakhstan, p. 131, Almaty.

Figure 13: Pasture yields (dry mass)



Source: Torehanov, A. A. et al. 2008. Meadow and pasture feed unit potential, p. 446. Almaty, Galsm.

The period for prime-quality spring grass is short (Table D.2) as plants mature rapidly in summer, becoming less digestible. In the south and east, mountain grazing is preferred in summer. In the south, winters are relatively mild and short. In semi-desert areas, livestock densities are very low; these areas are best used lightly by camels.

In good pasture areas, summer pasture quality is adequate for beef steers to make seasonal weight gains of 100 to 120 kg, and for suckling beef calves to reach late summer weaning weights of up to 220 kg (at six months of age).[40]

In winter, hardy animals such as local horses survive outdoors, as long as the pastures are not covered by ice. Dry ewes, when aided by fat reserves, also manage to maintain themselves on winter pasture with light snow.

It is likely that the use of protein/urea supplements can greatly enhance the effective utilization of grasses. In some cases, in-pasture feeding of extra energy may also have a multiplier effect, but this is not included in current recommendation packages. As shown in Table D.2, Kazakhstan has ample grain feed resources, so it is recommended that trials be carried out in this area.[41]

Table D.2: Nutritional quality of common mixed grass stands in natural pasture

	Southern, southeastern and southwestern Kazakhstan						Central, northwest and eastern Kazakhstan			
	Feather grass, sheep fescue, wormwood grass stand						Feather grass, sheep fescue, wormwood grass stand			
	May	June	July	Aug	Sept	Oct	May	June	July	Sept
Dry matter (DM)	183	210	434	684	728	711	213	287	510	766
g P/kg DM	3.3	4.3	1.6	0.7	0.4	0.6	6.1	5.9	2.9	1.2
FU/kg DM	1.04	1.24	0.53	0.29	0.23	0.27	0.99	0.91	0.43	0.27
MJ/kg DM (approximate)	6 173	7 361	3 151	1 738	1 388	1 589	6 196	5 694	2 711	1723
g CP / kg DM	163	155	66	39	34	38	130	134	60	36
FU = Russian feed unit =		5 946	MJ net energy for lactation (approximately)							
CP = crude protein		P= phosphate								

Source: Zhazylbekov, N.A. et al.,2008. Feeding agricultural animals and poultry, feed production technology, Almaty.

40.- As stated by Dr Krutchkev, a senior research officer for beef cattle in Almaty.

41.- Zhazylbekov, N.A. et al., 2008. Feeding of agricultural animals, birds and fodder production technology., Almaty. Pasture feeding is recommended for beef cows that are losing fat cover.

Gross grazing capacity: The theoretical capacity in years with good rainfall and ideal livestock distribution over the land is estimated in Table D.3.

Table D.3: Estimated maximum carrying capacity

Land available	Area, million ha	Average sustainable off-take, kg DM/ha	Yield, million tonnes
Summer grazing	75	650	48,75
Winter grazing	20	100	2
Autumn/winter grazing	30	150	4,5
	125		
Tonnes DM herbage or hay/year/LSU (500 kg) @ gross use 2.5% x LW per day			4.56
Carrying capacity, maximum LSU (500 kg), million			12

Sources: Schillhorn van Veen, T.W. 2004. Rangelands in transition. Technical Paper No. 31384. Washington, DC, World Bank, based on Statistics Agency data.

In Soviet times, stock surpassed this capacity to reach about 13.5 million LSU,[42] and there was land degradation, especially of more vulnerable grazing lands. Another reference point for assessing capacity is the livestock density estimated for the turn of the twentieth century:[43] based on similar calculations, this would have been about 10 million LSU. However, it should be noted that the nomadic herding system practised at that time ensured good livestock distribution over the area. A present, much of the best area has been converted into cropland, and other areas are degraded or left unused because of being too remote or lacking a water supply. Thus, caution is required. It should also be noted that static estimates of grazing capacity, such as those in Table D.3, risk overestimating the true situation, because they do not take into account the extraction of minerals from the soil (e.g., phosphate), and the reduction of soil fertility and gross yields of plants.

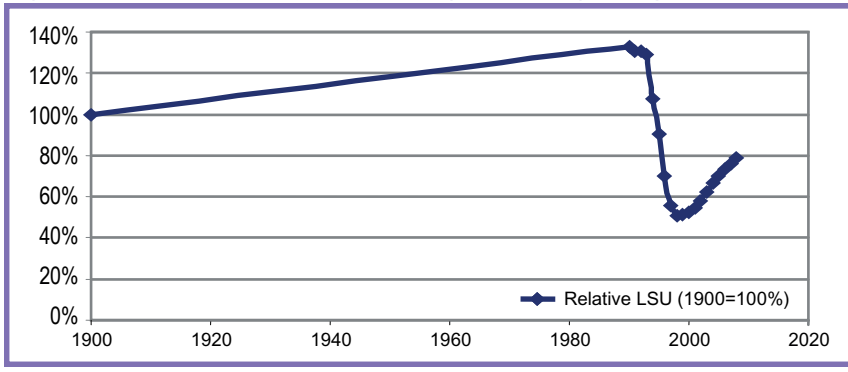
After the collapse of the *kolkhozes*, the rangelands are generally underused. The present intensity of use, with near to 8 million LSU, is about 80 percent that of 1900, recovering from a low of about 50 percent. It therefore appears safe to say that some expansion of the herd is possible, especially because animals

42.- LSU of 500 kg. For December (when young stock numbers are low), average cattle numbers were multiplied by 0.8, sheep by 0.15, and horses and camels by 1.

43.- Schillhorn van Veen, T.W. 2004. Rangelands in transition. Technical Paper No. 31384. Washington, DC, World Bank, based Statistics Agency data.

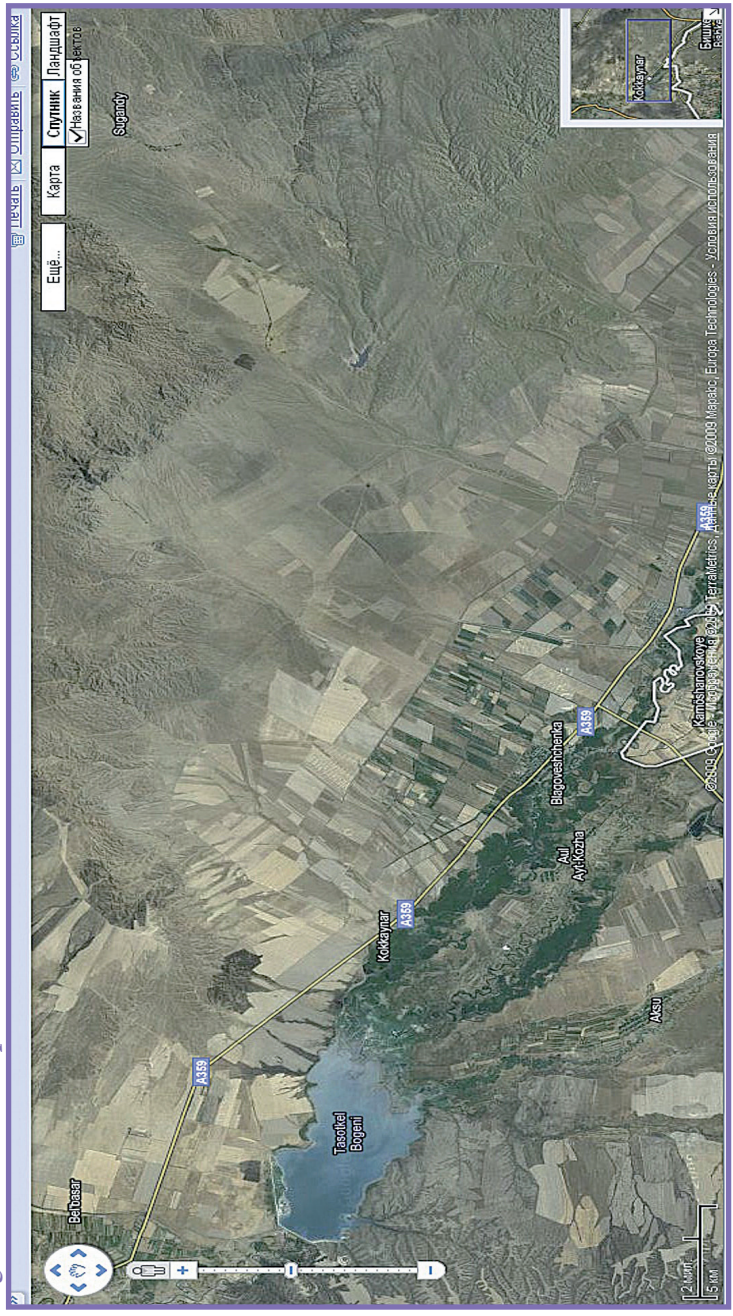
now depend in part on agricultural products. However, expansion must go hand in hand with a better distribution of the animals over the land. As already mentioned, the pastures near villages are overused.

Figure 14: Gross use intensity of rangeland for grazing livestock



In addition, most of the farmland of former *kolkhozes* and *sovhozes* in the populated southern and northern areas of Kazakhstan has been fragmented into much smaller farms and allocated to re-dimensioned AEs, private PFs and HHFs. Currently, a sort of patchwork pattern is apparent in farmland, and one owner often owns or leases plots that are not connected to each other (Figure 15).

Figure 15. Farmland patchwork in the south



Source: Googlemaps.

Exploitation of the country's significant resource base is highly uneven, ranging from overgrazed to totally unutilized areas. Households and smallholders currently concentrate the bulk of their stock and the lack of economies of scale prevents them from practising the traditional nomadic system. Hence, the pressure on pastures surrounding populated areas has drastically increased. Animals graze mostly around rural settlements (within 8 km in winter and up to 15 km in summer),[44] and the animal pressure on these areas is between 20 and 250 percent higher than the potential carrying capacity, resulting in a reported 27 million ha of overgrazed land.[45] The unregulated communal ownership of agricultural land belonging to village-level administrations aggravates the situation, owing to the failure to assign responsibilities for rational use and maintenance.[46]

Although the rangeland area currently being utilized is unknown, it seems that only about 4 to 6 of pastures have benefited from some kind of improvement, and the potential for expanding the grazing area and boosting its productivity is considered to be high. This is especially true in northwestern regions of the country, where one-third of formerly cultivated land has been abandoned. Marginal arable area should be converted back into pastureland, to improve land use and ecology. The World Bank-supported Drylands Management Project is a first pilot example of this, showing the viability of converting abandoned arable land back into pastures.[47] As reported, after inter-sowing with quality, higher-yielding plant species, improved land may produce up to 2 tonnes/ha of hay.[48] The productivity of semi-desert pastures may increase dramatically by inter-sowing with saxaul.[49]

44.- Field observations; World Bank. 2004. Animal breeding of Kazakhstan – revival support, p.199. Washington, DC. 199 pp.

45.- Reported by Sh. Kusaev (Kazakhstan Animal Breeding Research Institute) during interview; Sch llhorn van Veen, T.W. 2004. Rangelands in transition, p. 42. Technical Paper No. 31384. Washington, DC, World Bank.

46.- Ibid. p. 31..

47.- World Bank. 2003. Proposed Global Environment Facility Grant to the Amount of USD5.27 Million to the Government of Kazakhstan for Drylands Management Project, p. 110. Report No 25929-KZ. Washington, DC.

48.- Schillhorn van Veen, T.W. 2004. *Rangelands in transition*, p. 15. Technical Paper No. 31384. Washington, DC, World Bank.

49.- Widely practised in Soviet times, saxaul inter-sowing leads to yield increases of up to 7 tonnes/ha; Interview with researcher from the southern research institute of sheep breeding, Abdraimov Sejfula.

Degradation and environmental risk: The following adversities and risks affect rangeland:[50]

- Drought: All of Kazakhstan experienced severe drought in 1991.
- Ice storms (*dzud*): Regional and seasonal ice storms affect grazing animals.
- Fire varies by year and season.
- Weed invasions affect 2.5 to 4.5 million ha and include poisonous plants.
- Locusts: 8 million ha (2000) of abandoned farmlands provide breeding sites.
- Wind erosion: On 50 million ha, sand dune formation threatens farmland and villages.
- Water erosion affects 6 million ha.
- Salinization affects 3 to 4 million ha, including more than 2 million ha in the Aral Sea region.
- Risks of salty dust storms affect the rest of Kazakhstan.
- Radiation and military waste: 11 million ha are affected, owing to the Semipalatinsk testing grounds and other causes.
- Space programme: 4.8 million ha is affected by fuel and waste from the flight paths of space craft.

Further updates include Torehanov's report (2005) that 27 million ha is overgrazed, 4.5 million ha is overgrown with inedible species, and approximately 30 million ha suffers pollution from various sources, including contamination from the Baykonur space launch base (Kyzilorda region), radioactivity from the Semipalatinsky nuclear testing area (between Semipalatuns and Pavlodar regions) or the results of oil extraction activities (western regions).

For practical farm management, drought, ice storms and fires are the most critical risks. This implies a need for traditional mobile herding, flexibility and other precautionary measures (hay/forage stocks, flexible

50.- Schillhorn van Veen, T.W. 2004. Rangelands in transition. Technical Paper No. 31384. Washington, DC, World Bank.

herding and slaughter age, firebreaks, etc.). Ideally, ranches should cover land in at least two geographically different regions.

Reports from East Kazakhstan indicate that the closure to grazing of former nuclear test grounds is not enforced. For consumer protection, the waste that resulted from military and space programmes must be strictly controlled so that cattle do not graze in affected areas.

Fodder and forage

For winter feeding, especially of dairy cows, which make up the majority of cattle and calves, farmers depend on hay, which is also needed for other animals in periods of bad weather and for semi-intensive forms of sheep production. In Kazakhstan, sheep are generally fed on pastures all year round, but when snow cover is too thick or temperatures are extremely low they are moved into shelters and fed with hay and additional feed. This generally occurs for a anything between ten days in the southern deserts to 130 days in some northern regions.[51] Thus, feed and forage stocks play a more or less crucial role in the diet varying from 5 to 20 percent of the yearly food allowance to a maximum of 35 percent in extreme northern regions.

More hay is needed in winter to compensate for overgrazing of the pastures around villages. Estimated total use of harvested forage, mainly pasture hay, is given in Table D.4.

Table D.4: Approximate consumption of forages, 2008 (dry basis

Forage	'000 tonnes
Sheep	1 169
Cattle	3 738
Horses	417
Pigs	0
Total	5 325

The principal sources of hay are hayfields and meadows on low-lying land that is relatively moist. A total of about 5 million ha is registered as hayfields

51.- Tokseitova, R.A. et al. 2008. Spatial distribution of animal breeding in natural and economical zones of regions of Kazakhstan, p. 66. Almaty .

with the land management agency. A breakdown by *oblast* is given in Table 8, which shows that, compared with livestock numbers, hayfield area is relatively large in west Kazakhstan and smaller in the south. About half of the hayfield area is leased to or owned by PFs and AEs. PFs with the necessary equipment usually also cut hay for selling. Additional forage is obtained from sown pasture and forage crops such as (whole plants of) peas, oats, silage maize and alfalfa. These high-quality forages are used in larger dairies.

These sources can easily meet current consumption requirements. If the demand for winter forage expands significantly, more cropland will need to be devoted to forage crops. As livestock numbers continue to expand in the south, there will be an increased need for transhumant grazing and the use of standing hay in warmer lowland areas in winter. In northern *oblasts*, hay could be complemented with wheat straw,[52] although short-standing varieties and dry climates reduce vegetation growth and hence straw mass.

Most hay is of poor quality and cannot be used as a sole feed. Mowing grass at an earlier stage to obtain better-quality hay might be economically justified.

For sustainable use and productivity, hayfields need manure or fertilizer.[53] At present, the manure available is rarely used. Increasing the productivity of meadows would enhance the quality of forage (with earlier cutting) and the efficiency of forage harvesting equipment.

Most haymaking equipment is old, poorly managed and unreliable. This situation is an issue in the livestock industry. Table 9 gives an estimate of the investment needed to replace old haymaking equipment, based on medium-scale units operated by PFs and processing 300 ha/year. About 10 000 such units are required. The total costs amount to about T 44 billion, although it is assumed that most tractors will not need replacement.

Heavy-duty forage harvesting units will be required for feedlots and

52.- Farmers would need to use some extra concentrate feed to compensate for the low nutritional value of straw.

53.- Torehanov, A.A., Alimayev, I.I. and Orazbayev, S.A. 2008. Meadow pasture forage production. Summarizes the results of experiments. Manure or fertilizer applications can double the yields on good meadows.

large dairy farms. If it is assumed that the tractors used for cereal cropping can be used for this (at different times of the season), the investment in forage equipment for a feedlot of 2 500 head would amount to about T 33 million. A similar investment would be required for a dairy farm of about 1 000 cows with 100 percent stall feeding.

Feed/concentrates

Supply of and demand for feed ingredients: Cheap feed ingredients are a major competitive advantage for Kazakhstan's livestock production, in common with other countries such as the United States of America, Brazil and Argentina. However, the country's arid conditions limit the potential supply of ingredients. When shortages occur, feed ingredient prices increase owing to the costs of transportation and importation. Another factor that makes the feeding situation potentially unstable is that wheat is an important feed ingredient and wheat prices react more quickly on the world market than other feed prices do. This is illustrated in Figure 16, which shows that in years with average yields, the average price of hard wheat is about USD50 to $60 above the price of maize.

The approximate supply of feed ingredients in 2008 is given in Table D.5. For wheat, the quantity allocated to feed is somewhat arbitrary and depends on market conditions. Wheat of various qualities is produced. The best-quality wheat commands a high price, and is therefore not suitable for use as livestock feed. Industry specialists estimate that up to 7 million tonnes could be used for livestock feeding, another 7 million tonnes for local milling, and 7 million tonnes for export.

An increase in the area under soybeans is expected in the near future. On the other hand, the traditional import of oil seeds from Uzbekistan, for processing in Shymkent, is reported to be declining. Oil extraction plants are left idle.

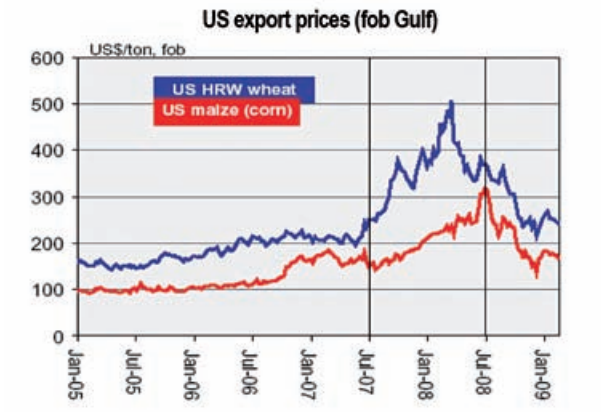
Peas, which are a dryland crop, can be used to replace soybeans without problems, if the pea varieties have low trypsine-inhibiting activity and low other anti-nutritional factors and/or are pelleted under steam.[54] It is also

54.- Jongbloed, W. and van Diepen, J.T.M. 2007. *Digestibility and feed value of a number of organically grown energy-rich feeds feed for pigs.* Report No. 109. Wageningen, Netherlands, Animal Sciences Group, Wageningen

possible to increase the areas under sunflower and safflower. The supply and estimated consumption of feed ingredients are shown in Tables D.5 and D.6

It can be concluded that there is sufficient supply of feed ingredients for expansion of the livestock sector. However, when local demand for feed and flour milling exceeds 50 percent of the normal crop, it would be wise to expand storage and retain buffer stocks for drought years.

Figure 16: Reaction of wheat and maize prices to shortages of wheat



Source: International Grains Council Report for Fiscal Year 2007/08.

University; Krimpen MM van et al. 2004. *Peas in diets of organic weanling pigs*. Report No. 32. Wageningen, Netherlands, Animal Sciences Group, Wageningen University; Gatel, F. and Grosjean, F. 1990. Composition and nutritive value of peas for pigs: A review of European results. *Livestock Production Science*, 26.

Table D.5: Approximate domestic supply of feed ingredients, 200

Crop	'000 tonnes			
	Harvest	Feedgrain	Bran/cake	Total available for feed
Wheat	20 100	3 000	1 750	4 750
Barley	2 500	1 500	200	1 700
Maize	420	336	0	336
Oats	230	115	23	138
Sunflower seed	206	10	84	94
Soya	88	5	62	62
Cottonseed	112	6	50	50
Peas	26	13	0	13
Total	23 682	4 985	2 169	7 143

Sources: Statistics Agency harvest data; estimates for cottonseed and pea harvests and for other data.

Table D.6: Approximate consumption of feed ingredients, 200

Concentrate	'000 tonnes
Sheep	538
Cattle	3 436
Horses	177
Pigs	1 169
Poultry	935
Total	**6 255**

Estimates.

Regulatory framework for the feed industry

A complete regulatory framework for the feed industry exists.[55] The regulations focus primarily on food safety aspects. A rather strict policy appears to be pursued, which excludes monensin[56] from the list of permitted additives. This additive is widely used in the United States of America and elsewhere, but was banned in the European Union (EU) in 2006.

55.- Law of the Republic of Kazakhstan on Food Safety; rules for State registration of fodder and fodder additives that are produced (manufactured) for the first time and/or imported into the territory of the Republic of Kazakhstan for the first time; technical regulation requirements for safety of feed and feed additives; and the Committee of State Inspections in Agriculture's National Register of Veterinary Drugs, Feeds and Feed Additives, 2009.

56.- An antibiotic used to regulate functioning of the rumen.

Past regulations in this sector were aimed at ensuring that farmers were not cheated. An element of this concern is retained in the obligation for compound feed mixers to file for approval of new mixtures. The approval is valid for two years, after which the company has to reapply.

Although it is crucial to maintain an independent quality control service,[57] restricting the industry's flexibility to adjust compound mixes according to market conditions and supplies is undesirable. Where possible, controls should rather concern the nutritional specifications (fibre, sugars, starch, soluble starch, anti-nutritional factors, etc), leaving freedom for variation in ingredients. This level of quality control requires a specialized agency that operates a good laboratory and has field inspectors for taking samples during unannounced visits. Such facilities do not yet exist in Kazakhstan.

Existing capacity and technology level in the compound feed industry

Table D.7: Installed and used capacity of feed mills, 2008

	Capacity installed '000 tonnes/year	Capacity used '000 tonnes/year	Total concentrate use in sector '000 tonnes/year
Poultry	424	205	935
Pigs Cattle, sheep, etc.	978	518	1 165 4 550
Total	**1 302**	**723**	**6 650**

Some feed mills are well placed to serve wide areas, being located near flour mills and principal railways. As noted (Table A.5), the feed rations provided by national feed mills do not match international standards. One feed mill was also reported to have poor laboratory facilities so was not practising least-cost ration optimization, as precluded by the current regulatory settings.

With encouragement, training and improved supervisory and technical infrastructure, the compound feed milling sector could play a substantial role, especially for medium-sized farms that do not have the infrastructure and expertise to compose and mix feed themselves.

57.- It is imposs ble to evaluate the quality of compound feed without using a laboratory.

Infrastructure

Access to water sources is a key issue for rational rangeland utilization. Unfortunately, in many regions (e.g. Shymkent), much of the infrastructure established during the Soviet period has deteriorated or been destroyed. The previously State-controlled maintenance system for rangeland infrastructure was discontinued in the mid-1990s. In many semi-desert and desert lands in the country's centre, watering points and wells are insufficient in number or are not functioning.

Industrial and transport infrastructure is undeveloped in many rural areas and should be considered a priority public sector investment area for agricultural development and improving the quality of life of rural populations.

Table D.8: Agricultural producers' access to infrastructure (percentages with access)

Infrastructure	Enterprises	Farmers
Surfaced roads to district centre	89.9	91.7
Intra-farm surfaced roads	21.7	19.7
Direct water sources	15.3	12.5
Telephone	49.7	20.3
Internet	8.2	0.1

Source: Statistics Agency.

E

THE POULTRY SUB-SECTOR FEED BASE

A model developed by the Hubbard poultry genetics company was used to calculate bird numbers and associated feed requirements under Kazakh conditions. These numbers are shown in Table E.1, together with key performance indicators used for the model. Using 2009 (projected) total domestic poultry meat production estimates of 75 258 tonnes, it can be seen that almost 40 million birds (including breeders with 2.3 shifts a year) and more than 200 000 tonnes of feed are required to produce this amount of chicken meat.

Table E.1: Predicted bird numbers and feed requirements to produce set tonnages of poultry meat

Feed required/tonne of carcase meat - Hubbard					Birds Required		
Carcass meat, tonnes	Breeder feed	Broiler feed	Total feed		No. of broilers @ intake/42 days	No. of breeders @ intake/64 days	Total birds needed
1	274	2,463	2,738	Kg	526	5	531
10	3	25	27	Tonnes	5,257	50	5307
100	27	246	274	Tonnes	52,565	504	53070
1,000	274	2,463	2,738	Tonnes	525,652	5,044	530695
10,000	2,743	24,632	27,375	Tonnes	5,256,518	50,436	5306954
100,000	27,434	245,321	273,755	Tonnes	52,565,181	504,358	53,069,539
75,258	20,646	185,376	206,022	Tonnes	39,559,504	379,570	39,939,073
207,158	56,832	510,274	567,105	Tonnes	108,892,977	1,044,818	109,937,795

Assumptions used in the Hubbard feed requirements model			
Hatchability	82.0%	Broiler LW 42 days, kg	2.32
Feed conversion ratio	1.95	Carcass yield	82.0%
Feed wastage	3.50%	Dressed weight, kg	1.90
Broiler liveability	93.5%	Breed of bird	Hubbard

To divide total feed requirements into constituent ingredients, it is necessary to examine typical ration formulations used by poultry farms, both commercial and smallholder or HHF.

Commercial broiler rations

A detailed sample of commercial broiler rations used over four ten-day intervals by large enterprises during 2009 is provided in Table 12. Points of particular interest include:

(1) the highly significant inclusion rates of wheat across all rations, averaging approximately 50 percent;

(2) the inclusion rates of SBM across all rations, averaging approximately 17 percent;

(3) the highly significant contribution to ration cost of SBM, averaging approximately 30 percent in all rations;

(4) the significance of fishmeal in pre-starter and starter rations;

(5) the current low level of sunflower meal in rations;

(6) the substantial number of imported ingredients, although the majority of these are micro-additives, which can be imported without great expense;

(7) SBM is usually available through JSC Vitasoy, unless shortages occur and it has to be imported, when the percentage contribution to ration costs of imported ingredients becomes almost 50 percent; when SBM is supplied domestically, imported ingredients account for only about 25 percent of rations costs;

(8) import tariffs during 2009 were 5 percent for SBM and 5 percent for fishmeal;

(9) import tariffs under the CU (from 1 January 2010) are 5 percent for SBM and no tariff for fishmeal;

(10) import tariffs under the CU are 10 to 15 percent for vitamins and feed supplements.

Imports of micro-additives: Most commercial broiler and breeder rations contain a reasonable number of minor inclusion-level ingredients

that are commonly imported. Most poultry companies worldwide source these from large foreign manufacturers of the micro-additives lysine, methionine, trace elements, vitamins and amino acids, and additives such as anti-oxidants, mould inhibitors and pellet binders. This is generally the most cost-effective option, even for large commercial poultry companies and feed milling groups in other countries; as such products are highly technical in formulation and are best left in the hands of specialist international quality-assured companies. There is a government regulation for imported additives such as these in Kazakhstan.

Smallholder multi-purpose poultry rations

Table E.2 shows a typical ration used by many smallholders (PFs and HHFs) for egg layers and/or meat chickens across Kazakhstan. Points of note include the high percentage of bread waste (stale, beyond expiry date) used in some formulations, particularly in HHFs, and the generally far lower nutritional quality of the rations, together with far lower costs, compared with commercial formulations (about one-third less). The formulations fed across the country vary considerably, depending on the local availability and cost of ingredients. Some smallholders use scientifically formulated pellets, crumbles or mash formulations supplied by commercial feed mills, or mills operated by large integrated enterprises.

Table E.2: Formulation of a typical ration used by smallholders for layers/broilers

Kazakh SMALLHOLDER POULTRY RATION				Dec'09
Typical basic farm ration - Layers &/or Broilers				
Feed Commodity	Inclusion basis		Ingredient	Ration As Fed
	As Fed %	DM %	Cost KZT/Tonnes	Contr KZT/Tonnes
WHEAT 12.5	55,00	58,07	18.495	10.172
BREAD WASTE 13.0	24,80	20,32	5.000	1.240
WHEAT BRAN 13.5	10,00	10,54	8.250	825
CORN 8.5	5,00	5,27	30.000	1.500
SUNFLOWER MEAL 37.5	3,00	3,25	26.000	780
LIMESTONE	2,00	2,32	10.400	208
SALT	0,20	0,23	15.000	30
	100,00	100,00	KZK/Tonnes	14.755
			USD/Tonnes	98,37

CRITICAL NUTRIENTS (DM basis)					
Cost $/T AF	14.755	Crude Protein %	14,1	Cal %	0,92
Cost $/T DM	17.273	By-Pass %	2,7	Phos %	0,48
DM %	85,4	Sodium %	0,10	Chloride %	0,41
ME MJ/kg	12,6	Crude Fat %	2,5	ADF %	5,2
Cal:Phos	1,9			NDF %	13,4

Supply of poultry feed commodities

National harvests of major grain crops: In 2007, national harvests of the major grain crops were: wheat 20.1 million tonnes, barley 2.5 million tonnes, maize 420 000 tonnes, oats 230 000 tonnes, and sunflower seed 206 000 tonnes. The 2009 wheat harvest yielded a record 21 million tonnes, overtaking the previous record set in 2007. A severe drought in 2008 led to a disappointing 17 tonnes grain harvest. According to the Director of the Meat Union of Kazakhstan, Marat Kuralov (personal communication, 2009), wheat with less than 23 percent gluten is generally regarded as animal feed grade: approximately 80 percent of the wheat produced in Kazakhstan is high-quality for flour milling, and 20 percent is feed grade. The ratio of gluten to protein is usually 2:1. Wheat with protein content of 14 percent or more is classified as first class wheat, while that with protein content of less than 11 percent is fourth class. Third and fourth class wheat is generally used for livestock feeding applications in Kazakhstan. Table E.3 shows the calculated domestic supply of feed commodities available for poultry, animal and livestock feeding in Kazakhstan during 2009. Competition for feedgrains and protein meals must be expected from egg laying farms, and the dairy, beef, pig, sheep and horse sub-sectors.

Table E.3: Approximate domestic supply of poultry feed commodities, 2009 (tonnes)

Grains/Oilseeds	Total Harvest	"Feed" Grain	Brans or Meal	Total
Wheat	17,000,000	6,000,000		6,000,000
Barley	2,500,000	1,500,000		1,500,000
Corn	470,000	375,000		375,000
Sunflower Seed	370,000		92,500	92,500
Soybeans	94,000		55,000	55,000
TOTALS		7,875,000	147,500	8,022,500

Feed requirements

Commercial broiler enterprises: Table E.4 calculates feed commodity requirements and makes comparisons with total feedgrains and proteins supply, based on 2009 projections for poultry meat or the significantly expanded tonnages assessed by KAF and other credit providers.

Table E.4: Approximate feed requirements of commercial broiler enterprises, current and projected

Current and Proposed Kazakh Poultry Meat Production, Tonnes per year		Approx Feed Requirements, Tonnes/yr **		
		Breeders	Broilers	TOTAL
Current total production, 2009 estimate on Jan-Sep	**75,258**	20,646	185,376	**206,022**
Future total production, pending finance	**207,158**	56,832	510,274	**567,105**

COMMERCIAL BROILER ENTERPRISES Ration Ingredient	Average % Inclusion in Generalised Commercial Ration	Feed Requirement vs Domestic Production (Tonnes/yr)		
		Present Requirement 2009	Future Req't with current applications	Total Feed Grains Supply 2009
Wheat	48,0%	98,891	272,211	6,000,000
Soybean Meal	15,0%	30,903	85,066	55,000
Corn	10,0%	20,602	56,711	375,000
Barley	10.0%	20,602	56,711	1,500,000
Sunflower Meal	3.0%	6,181	17,013	92,500
Fish Meal	3.0%	6,181	17,013	All imported
Miscellaneous additives	11.0%	22,662	62,382	Most imported
TOTALS	**100.0%**	**206,022**	**567,105**	**8,022,500**

Assumptions used in Hubbard Feed Requirements Model			
Hatchability	82.0%	Broiler LW 42 days Kg	2.32
Feed Conversion Ratio	1.95	Carcase Yield	82.0%
Feed Wastage	3.50%	Dressed Weight Kg	1.90
Broiler Livability	93.5%	Breed of bird	Hubbard

It is apparent that the total feedgrains and proteins supply in 2009 is greatly in excess of commercial broiler requirements, although under the expanded tonnages pending finance, a shortage of domestically produced SBM is forecast for the years ahead.

Commercial egg layer enterprises and smallholder mixed poultry farms: Table E.5 shows a calculation of poultry populations across Kazakhstan, in both commercial layer enterprises and smallholder mixed farms. Multiple information sources were used, including estimates of total egg numbers produced. The information suggests that the majority of birds in smallholdings are egg layers, with the consumption of older hens providing a source of chicken meat that may be as important as the broiler type breeds. Assumptions used include that egg layers in smallholdings are 20 percent less efficient than those in enterprises, principally owing to inferior disease control and lower nutritional standards of rations. It is also understood that poultry populations in smallholdings include unspecified numbers of turkeys, ducks and geese.

Table E.5: Estimated numbers of commercial layers and smallholder birds, with annual feed requirements

Estimated other Poultry COMMERCIAL LAYERS & SMALLHOLDERS		Approx Feed Requirements, Tonnes/yr		
Estimated Number LAYERS in Enterprises				
		Ave g/hd/day	Lifespan (days)	**TOTAL**
Calculations from Stats Agency total bird nos, 2009	9.582.840	113	525	**568.502**
Estimated Number both LAYERS + BROILERS in Smallholdings **				
Total smallholder population, Stats Agency 2009 est	14.300.000	Ave g/hd/day	Lifespan (days)	**TOTAL**
Layers, calculated similar data (SEE Appendix 2)	11.499.408	113	420	545.762
Broilers, by difference	2.800.592	104	50	14.563
				560.325

Tables E.6 and E.7 calculate feed commodity requirements and made comparisons with total feedgrains and proteins supply, based on recently calculated likely bird populations.

Table E.6: Estimated approximate feed requirements of commercial egg layer enterprises, 2009

	Feed Requirement vs Domestic Production (Tonnes/yr)		
COMMERCIAL EGG LAYER ENTERPRISES **Ration Ingredient**	**Average % Inclusion in Generalised Commercial Ration**	**Present Requirement 2009**	**Total Feed Grains Supply 2009**
Wheat	41,0%	233.086	6.000.000
Soybean Meal	12,0%	68.220	55.000
Corn	15,0%	85.275	375.000
Barley	10,0%	56.850	1.500.000
Sunflower Meal	2,0%	11.370	92.500
Fish Meal	4,0%	22.740	All imported
Miscellaneous additives	16,0%	90.960	Most imported
TOTALS	**100,0%**	**568.502**	**8.022.500**

Table E.7: Estimated approximate feed requirements of smallholder poultry farms, 2009

	Feed Requirement vs Domestic Production (Tonnes/yr)		
SMALLHOLDER POULTRY FARMS ** Ration Ingredient	Average % Inclusion in Generalised Smallholder Ration	Present Requirement 2009	Total Feed Grains Supply 2009
Wheat	55,0%	308.179	6.000.000
Bread Waste	24,8%	138.961	unsure
Soybean Meal		0	55.000
Corn	10,0%	56.032	375.000
Sunflower Meal	3,0%	16.810	92.500
Fish Meal		0	All imported
Miscellaneous additives	7,2%	40.343	Most imported
TOTALS	**100,0%**	**560.325**	**6.522.500**

Total poultry sector feed requirements in 2009, plus expansions: Table 13 gives an estimate of total poultry sector feed requirements in 2009 compared with the predicted supply of feedgrains and protein meals. If the projected growth of the commercial broiler industry is achieved by 2013, an additional 567 000 tonnes of feed will be required annually. Broken down into its component parts, this will mean an extra 272 000 tonnes of wheat (third or fourth class). These tonnages appear easily achievable for the huge Kazakh grains industry, but competition for domestically produced feedgrains and protein meals must be expected from the dairy, beef, pig, sheep, horse and other livestock sub-sectors.

If the poultry sector does not use decellulosed sunflower meal, these projections could also mean a further 85 000 tonnes of SBM annually. Although the 44 000-tonne SBM deficit from current domestic supply could be imported, it is an expensive commodity, especially with the 5 percent import tariff (unchanged under CU regulations), and importation means continuing reliance on foreign suppliers. However, it is certainly welcome news (Zholdassov, personal communication, 2009) that MoA has recently announced a plan to promote a fivefold increase in soybean plantings in Kazakhstan over the next five years, with an associated major increase in the amount of SBM produced.

Imports/exports of soybeans, SBM and fishmeal

The imported products indicated in Table E.8 are utilized by not only the poultry meat sector, but also the poultry egg sector, the pig sector and possibly to a small degree the dairy sector.

Table E.8: Trade balance for soybeans and countries supplying main imports

SOYBEANS	Year	Imports (Tonnes/yr)	Exports (Tonnes/yr)
	2006	20.852	4.146
	2007	141.833	7.994
	2008	1.530	13.784
1st 10 tonneshs	2009*	12.435	390
	TOTAL	**176.651**	**26.314**

SOYBEANS	Source of Imports	Tonnes/yr	Percentage
2006-2009	CIS Countries	58.764	33,3
	Ukraine	40.729	23,1
	Russia	17.942	10,2
	others	59.216	33,5

Source: Calculated from Customs Committee of Ministry of Industry and Trade data, November 2009.

It is apparent from Table E.8 that imports of soybeans over the past four years have far out-weighed exports. The reasons for the huge level of imports in 2007 are not clear. During 2008, Statistics Agency data suggest that 88 000 tonnes of soybeans were processed (assuming most of the domestic harvest), with JSC Vitasoy processing 54 000 tonnes (61 percent) of this total. VitaSoy produced 9 500 tonnes of soybean oil from these soybeans (a yield of approximately 17.6 percent). Yields of SBM from soybeans processed are commonly in the order of approximately 60 percent.

Table E.9: Trade balance for SBM and countries supplying main imports

SOYBEAN MEAL	Year	Imports (Tonnes/yr)	Exports (Tonnes/yr)
	2006	1.060	21.494
	2007	2.562	19.178
	2008	3.443	37.274
1st 10 tonneshs	2009*	18.143	19.330
	TOTAL	25.207	97.277
SOYBEAN MEAL	**Source of Imports**	**Tonnes/yr**	**Percentage**
2006-2009	Argentina & Brazil	4.038	16,0
	CIS Countries	3.752	14,9
	Russia	2.755	10,9
	Ukraine	997	4,0
	others	13.665	54,2

Source: Calculated from Customs Committee of Ministry of Industry and Trade data, November 2009.

Imports of both raw soybeans and SBM rose dramatically during 2009, from far lower levels during 2008. This was possibly caused by the commercial poultry industry downturn in 2008 and the associated high prices for soybeans.

Table E.10: Trade balance for fishmeal and countries supplying main imports

FISH MEAL	Year	Imports (Tonnes/yr)	Exports (Tonnes/yr)
	2006	10.383	
	2007	7.740	
	2008	8.828	
1st 10 tonneshs	2009*	8.130	
	TOTAL	35.082	0
FISH MEAL	**Source of Imports**	**Tonnes/yr**	**Percentage**
2006-2009	Latvia	6.730	19,2
	Ireland	4.901	14,0
	Russia	40	0,1
	CIS Countries	40	0,1
	others	23.371	66,6

Source: Calculated from Customs Committee of Ministry of Industry and Trade data, November 2009.

Imports of fishmeal have been substantial over the past four years, as there is no domestic industry. This is unlikely to change in a totally land-locked country. Latvia is currently the main source of fishmeal for Kazakhstan.

Import tariffs applicable to feed commodity imports[58]

Kazakh import tariffs in 2009:

- Soybeans: 5 percent.
- Soybean flour: 5 percent.
- SBM: 5 percent.
- Fishmeal: 5 percent.

Import tariffs under the CU, since January 2010:

- Soybeans: no quota expected, tariff is 0.
- Fishmeal: no quota expected, tariff is 0.
- SBM: no quota expected, tariff is 5 percent.

Potential for decellulosed sunflower meal in poultry rations

In view of the significant quantities of highly competitively priced sunflower meal (SFM) in the country, an interesting opportunity for the Kazakh poultry industry would be to follow the example set by companies in Ukraine, the Russian Federation, Black Sea countries and throughout the world in further processing SFM to make it better utilized and more cost-effective in poultry rations.

The value of SFM is largely dependent on hull content and product consistency, but both of these factors can be favourably modified using dehulling and further treatment techniques. Treated product is often called "decellulosed sunflower meal" owing to the high content of non-digestible cellulose in sunflower hulls. In the absence of dehulling, SFM has a hull content of 46 to 48 percent, but this can be reduced to 20 to 22 percent following mechanical removal of hulls, solvent or mechanical extraction of oil, and chemical treatment to remove the polyphenolic compounds chlorogenic, quimic and caffeic acids. Although these compounds are not toxic and have no anti-nutritional properties (Theertha, 1990, and Sosulski

58.- Information based on United Customs Tariff project published at www.customs.kz as of 27 November 2009. See also www.cusroms.kz/exec/stat/stat?tip=13.

and Fleming, 1979)[59], they do complex with proteins, thereby lowering nutritional value owing to their interaction with amino acids (Gandhi et al., 2008) [60].

An Indian research group has recently published a relatively simple process for the production of low polyphenol- and low phytate-content SFM (Gandhi et al., 2008)[61]. (Phytates bind and lower the bioavailability of phosphorus, so are worthy targets for removal at the same time as polyphenolics.) The process involves:

(i) sunflower seeds cleaned, graded and dehulled mechanically;

(ii) dehulled seeds steam-flaked to 0.3 mm thickness, and fat extracted using food-grade n-hexane;

(iii) polyphenols and phytates removed using solutions of NaHCO3, Ca(OH)2, NaCl, acetone, HCl, distilled water, ethanol, methanol and sodium sulphite at meal-to-solvent ratios between 1:10 and 1:50 (weight/volume).

Although SFM has a lower lysine content than SBM, it contains significantly higher amounts of the important amino acid methionine than SBM does, and also has better functional properties, such as higher fat content and higher oil emulsifying properties (Martinez and Wilda, 1979)[62]. After treatment, decellulosed SFM can achieve crude protein contents of about 44 percent, up from conventional levels of approximately 32 to 39 percent. Other nutritional improvements in SFM after treatment are shown in Table E.11. In feeds for broiler chickens, up to 50 to 75 percent of the soybean content of rations can satisfactorily be replaced by

59.- Theertha, PD (1990): Proteins of the phenolic extracted sunflower meal. 1. Simple method for removal of poly phenolic components and characteristics of salt soluble proteins. Lebnsm. Wiss.u.Technology 23: 229-235.
Sosulski, F, and Fleming, SE (1979): Chemical, functional and nutritional properties of sunflower protein products. J AOCS, 54: 100a-104a.

60.- Gandhi, AP, Jha, K, and Gupta, V (2008): Studies on the Production of Defatted Sunflower Meal with Low Polyphenol and Phytate Contents and its Nutritional Profile. ASEAN Food Journal 15 (1): 97-100. (Central Institute of Agricultural Engineering, Bhopal, India.)

61.- ibi idem.

62.- Martinez, H, and Wilda, K (1979): Functionality of vegetable proteins other than soy. J AOCS 56.

treated SFM, particularly when supplemented with additional synthetic lysine (Slavica et al., 2006)[63]. The product can also be fed to growing pullets and breeder flocks.

The opportunities for using decellulosed SFM in the Kazakh poultry sector need further investigation. However, decellulosed SFM is one of relatively few viable options for reducing ration costs in poultry operations, and it appears that rival Ukrainian and Russian poultry enterprises are currently using it. Using decellulosed SFM as a partial substitute for SBM has powerful potential benefits, including the additional value of utilizing the removed sunflower hulls as a fuel source for shed heating systems.

Table E.11: Improvement of the nutritional value of SFM with mechanical and chemical treatments, and comparison with SBM

(As fed basis)	Soybean Meal	Sunflower Meal	Upgraded # Decellulosed SFM
Dry Matter %	89,50	89,50	
Metabolisable Energy MJ/kg	11,50	9,00	
Crude Protein %	44,00	39,60	44,00
Fat %	1,00	1,70	
Crude Fibre %	5,30	21,00	9,70
Ash %	5,60	6,60	
Lysine %	3,15	1,68	3,15
Avail Lys %	2,76	1,27	
Methionine %	0,74	1,07	
Avail Meth %	0,67	0,96	
Cysteine %	0,63	0,92	
Avail Cys %	0,44	0,71	
Phytates %		1,20	0,20
Poly phenols %		4,27	0,30

63.- Slavica, S, Jovanka, L, Olivera, D (2006): Enhancing nutritional quality of sunflower meal in broiler feeding. Archiva Zootechnica 9: 65-72. (Faculty of Technology, Feed Technology Department, Novi Sad, Serbia & Montenegro.)

Potential for expansion of the compound feed milling industry

Given the substantial opportunity for increasing grain and concentrate feeding for many animal species in Kazakhstan, expansion of the country's commercial feed milling industry is particularly appealing. However, not all analysts appear to see it this way. Recently documented discussion of the limitations of expanding the industry – in the Meat Sector Master Plan for Kazakhstan commissioned in 2009 by KAM – seems somewhat short-sighted and narrow in focus. The main problem areas identified in the report for KAM were detailed as:

(1) the current presence of privately operated feed mills within larger animal enterprises – poultry, pig and dairy farms – that produce their own requirements in-house;

(2) the distance of animal feeding enterprises from existing feed mills, resulting in increased transportation costs;

(3) weak marketing activities at existing feed mills;

(4) lack of mechanisms for direct State support of feed production enterprises;

(5) the fact that 85 to 90 percent of livestock development is in HHFs, implying a very low level of technological advancement and "no demand for feed";

(6) lack of sophisticated laboratories to determine the quality of feed ingredients, and "poor quality of manufactured feed".

None of these areas of concern should be regarded as significant deterrents to the design of a suitable model for promoting and establishing a viable commercial feed milling industry in Kazakhstan. There are successful stock feed milling enterprises that originated with involvement in the poultry meat production business throughout the most advanced and many developing countries in the world.

Worldwide success of feed milling industries with origins in poultry production

Huge international stockfeed milling groups that have developed from a core business of poultry meat production include Tyson Foods (33 mills) and Pilgrim's Pride (29 mills) in the United States of America, Charoen Pokphand in Thailand and throughout Southeast Asia, PT Japfa Comfeed in Indonesia and Viet Nam, Suguna Poultry in India, and Banvit AS in Turkey.

The modern 100 tonnes/day Banvit poultry feed mill in Bandirma, Turkey, was established in 2004 to replace an older facility that was unable to meet the demand for pelleted feed for the 650 contracted broiler grower farms and 55 contracted breeder farms supporting its enterprise, which currently produces 160 000 tonnes of chicken meat per year. The original Banvit mill now produces a comprehensive range of pelleted feeds for the dairy, beef and sheep industries of Turkey, and plays a significant role in stimulating rural communities and livelihoods in that country.

The claim that 85 to 90 percent of livestock development is in HHFs is misleading, as although 47 percent of the poultry sector's bird population is held in HHFs, 86 percent of Kazakhstan's poultry meat is produced by large AEs. It is therefore certainly incorrect to imply there is a low level of technological advancement and no demand for feed. The stated lack of sophisticated feed laboratories and the poor quality of feed are not sound reasons for losing confidence in a feed milling industry. Feed testing laboratories are not essential, given the huge international databases with precise details of the nutrient composition of all major grains, by-products and other feed milling commodities that are common in many countries. It is also not difficult to develop basic feed testing capabilities within existing flour mills, food factories or university chemistry laboratories. Poor-quality feed can result from many factors, but substantial international technical advice is readily available and this issue should not delay the development of a Kazakh industry.

Possible benefits of commercial compound feeds

Commercially prepared feed formulations are subject to operators' milling fees and profit margins. The general manager of a large poultry enterprise not far from Astana, with a feed mill supplying approximately 10 to 15 percent of its output to customers external to its own operations recently stated the cost of its milling process (meal production only, without pelletization, although pellet mills do not charge much higher) as being approx T 5/kg, or USD33/tonne, with some profit margin on top. The main costs and benefits from the use of commercial feeds, rather than mixes prepared on the farm, are summarized in the following. These may help to explain the worldwide appeal of commercial feeds in many of the more advanced animal production economies.

(1) Large commercial feed millers normally have far greater purchasing power through economies of scale, and benefit from their ability to enter into forward purchase contracts and long-term supply agreements. Many large mills purchase commodities on world markets and can utilize products such as maize gluten meal or dried distillers' grains from the United States of America, tapioca chips from Thailand, or copra and palm kernel meal from Malaysia, when imported in large bulk consignments by international commodity traders.

(2) Large commercial feed millers are often associated to their own or external flour milling operations, so benefit from the ready availability of low-cost by-products such as wheat bran and pollard or, in other countries, rice bran. These by-products are good-quality ingredients for feed for many animal species, particularly dairy and beef cattle, sheep and horses.

(3) Modern high-temperature feed pelletizing technology results in feed that benefits from the gelatinization of starch molecules within the grain, which improves energy availability. High temperatures can also denature the anti-nutritional factors that are present in some commodities, while the temperatures during pelletization also impart some degree of commercial sterilization to the feed, reducing the risk of contamination from Salmonella, E. coli and other pathogenic bacteria, which can be especially important in high biosecurity situations, such as on poultry breeder farms.

(4) The ability of commercial mills to mix homogeneously a wide range of macro and micro-ingredients provides the opportunity for more nutritionally advanced and cost-effective formulations. For example, low inclusion-level ingredients that have proven performance benefits, but that are not always likely to be used by home mixers, include synthetic amino acids, vitamins, trace elements, antioxidants, mould inhibitors, gut acidifiers, yeast cultures, rumen modifiers, flavour enhancers and veterinary therapeutic compounds.

(5) When examining the cost of commercial feeds, factors that home mixers do not usually take into proper consideration include the time they spend sourcing, handling and mixing their own formulations; the efficiency and hygiene status of their mixing plants; the low likelihood that they possess the least-cost feed formulation software routinely used by commercial mills; and their general lack of inclination to have ingredients tested for nutrient composition prior to purchase. Commercial mills always have access to testing equipment or laboratories, which ensures far better quality control of commodities.

Existing feed milling capacity in Kazakhstan

An estimate of Kazakhstan's current feed milling production level and capacity is provided in Table 10. According to MoA's registry of large and medium-sized enterprises, 22 companies produce feed, but only two are classified as feed manufacturers. The main activity of the majority of companies is the production of flour and flour products.

As can be seen from Table 10, the current level of feed mill utilization is only approximately 56 percent of design capacity. This has been explained as being partly owing to outdated milling technologies, and the general perception throughout the poultry industry of a lack of nutritional quality in feeds manufactured by commercial feed milling companies in Kazakhstan.

A recommendation that emerges from this analysis is that MoA, perhaps using JSC KAI, should promote the feed milling industry through the dissemination of information relating to the costs and benefits of compound feeds for Kazakhstan's livestock and animal production facilities. A component of an ongoing ACP supported by the World Bank is identifying the financial returns from increased supplementary feeding of livestock in Kazakhstan. Also of interest is the – albeit unconfirmed – local information that a private Kazakh bank has recently received an application for the funding of a major upgrade of facilities by a large poultry integrated enterprise, including a massive expansion of its present feed milling capacity to approximately ten times its own needs.

F

ANIMAL HEALTH

Public and private veterinary services

The Department of Livestock Sector Development and Veterinary Safety is one of MoA's 12 main departments.[64]

On the basis of the Veterinary Law, revised in July 2009, a significant decentralization of veterinary services is taking place. The Central Government remains responsible for central policies, regulations, guidelines and oversight of public bodies, and the Chief State Veterinary and Sanitary Inspector is directly responsible for all inspection work, particularly food safety issues. However, for preventive animal medicine and the control of epizootics, oblast (provincial) veterinary officers are under their local governments. Civil authorities can enact or withdraw quarantine measures only when proposed by the chief State veterinary inspector assigned to the territory. District-level veterinary officers are fully integrated into the local government.

The Veterinary Law also reasserts the methodology for licensing private veterinarians. All veterinary fieldwork apart from epizootics control and inspection services is left to the private sector. Private practices are already well established in many villages, and veterinarians also have veterinary pharmacies. In addition, they can be awarded government contracts for implementing official duties such as State-funded vaccination campaigns. In more sparsely populated regions, however, there is unlikely to be the

64.- Other departments with roles in the livestock supply chain include:
- Department of Development of Agricultural Markets and Processing Industry;
- Department of Analysis and Strategic Planning;
- Department of Regulative Framework;
- Department of Strategy of Natural Resource Use;
- Department of Arable Farming and Phytosanitary Safety;
- Department of Agricultural Mechanization.

economic basis for a private veterinary practice. This is aggravated by the low-input nature of much of the livestock industry where most animals are held by HHFs. Thus, only where veterinarians can engage in multiple economic activities would it be possible for them to maintain basic rural veterinary services.

There is a current shortage of professionals, because veterinary faculties are not attracting enough students. At present there are 5 400 fully qualified veterinarians, and 420 were graduated in 2008. These veterinarians are complemented by technical staff, 539 of whom graduated last year. In proportion to the livestock population, these numbers are no lower than those found in, for example, Western Europe, but in Kazakhstan the travelling distances are longer.

In Kazakhstan, information is tracked for 32 major infectious diseases of farm animals of economic importance, 16 of which are financed from the State budget. Diagnostic and preventive measures against these 32 diseases are carried out in accordance with the World Organisation for Animal Health (OIE) List of Dangerous Animal Diseases, Prevention, Diagnosis and Elimination.

To fulfil its mandate for ensuring transparency in the global animal disease situation, OIE manages the World Animal Health Information System (WAHIS), which is based on the member countries' commitment to notifying OIE of all main animal diseases, including zoonoses. In 2004, OIE member countries approved the creation of a new single list of diseases notifiable to OIE, based on the Terrestrial Animal Health Code. Currently, approximately 100 diseases are listed, 13 of which are poultry diseases, including highly pathogenic avian influenza (HPAI), Newcastle disease, Marek's disease, infectious bursal disease and avian infectious laryngotracheitis.

As an OIE member country, Kazakhstan currently provides six-monthly reports on its animal disease situation to the World Animal Health Information Database (WAHID), which provides access to all data held within WAHIS.

Evaluation of the epizootic situation for diseases registered in Kazakhstan

Infectious diseases that have been diagnosed in Kazakhstan and that can affect meat production and/or meat include foot-and-mouth disease (FMD), brucellosis, tuberculosis (TB), anthrax, blackleg and rabies. Table F.1 outlines positive sampling results over recent years.

Table F.1: Positive sampling results, 2001 to 2008

Disease	2001	2002	2003	2004	2005	2008
Rabies (homes)	127				107	49
Pasteurella (centres)		46				5
Brucellosis in cattle (points)		8	9	27	25	46
Brucellosis in sheep and goats (points)	18	30	30	37	39	136
TB in cattle (points)		4	4	5	2	1

Source: Adapted from MoA data.

FMD is not dangerous for humans, but is highly infectious for livestock. In Kazakhstan it occurred in 2001 and 2007, but was effectively contained. Wildlife can be a reservoir for FMD, which can also easily cross borders.

Brucellosis and TB are zoonotic diseases that affect humans. Diagnosis of chronic brucellosis is difficult and subject to studies, owing to the endemic nature of the disease.[65] A new method for assessing human brucellosis was recently developed in Almaty.[66] It thus seems that brucellosis is not yet under control, but the veterinary services are keen to reach a stage where vaccinations can be stopped.

The prevalence of TB and its debilitating effects historically have been a principal reason for introducing the inspection of slaughter cattle. The disease is difficult to eradicate, and has also appeared in the United

65.- The project brief for the International Science and Technology Center (ISTC) Brucellosis Project in Kazakhstan (No. K-1347, 2005) states that the disease has been seriously under-diagnosed and that sero-monitoring gave false negative results. Republican Sanitary Station and Epidemiological Station, Ministry of Health of the Republic of Kazakhstan, 05008, Almaty.

66.- Mizanbayeva, S., Smits, H.L., Zhalilova, K., Abdoel, T.H., Kozakov, S., Ospanov, K.S., Elzer, P.H. and Douglas, J.T. 2009. The evaluation of a user-friendly lateral flow assay for the sero-diagnosis of human brucellosis in Kazakhstan. *Diagn. Microbiol. Infect. Dis.*, 65(1): 14–20. Serum samples from all patients with culture-confirmed brucellosis, including those with chronic disease from Kazakhstan, tested positive with the new method.

Kingdom, where 12 000 animals have been slaughtered in recent years.[67] TB can survive in wildlife, humans can infect animals (dogs), and in one experiment TB bacteria were found to survive for at least 23 months in topsoil in Kazakhstan.[68] Kazakhstan has a long history of infection with TB. Strains have been found to be resistant to drugs,[69] and TB-infected herds are now impounded and destroyed, with compensation paid to farmers. However, some farmers avoid the testing. The veterinary service is in a difficult position, as raising the indemnifications too high could invite malpractice. Therefore, as for brucellosis, it cannot be assumed that TB will soon be eradicated.

Importing countries usually require that all possible precautions are taken so that infected animals do not enter the food or export chains.

Anthrax and blackleg are soil-borne diseases[70] that occur worldwide and are dangerous for humans. However, the number of cases is very few. In Kazakhstan, animals are vaccinated against anthrax and blackleg.

Rabies is known as a disease of dogs and foxes, but cattle can be infected by a bite, and then constitute a danger for farm personnel. Rabies is not associated with the meat trade,[71] because infected livestock show symptoms and can be isolated. Nevertheless, the EU requires monitoring of farm animals for rabies. In Kazakhstan rabies occurs quite frequently.

Transboundary disease situation and risks

Transboundary risks concern: i) livestock grazing in border areas; ii) imports of animals and meat; and iii) (for poultry) flying birds. Several grazing areas in Kazakhstan are contiguous to those of neighbouring countries. The risks of transmission of disease via grazing livestock crossing national borders are mitigated by band vaccinations in border zones.

67.- Dube, S. 2009. *Badger cull planned to halt bovine tuberculosis.* www.walesonliene.co.uk, 25 March 2009.

68.-Thoen, C.O., Steele, J.H. and Gilsdorf, M.J. 2006. Mycobacterium bovis *infection in animals and humans*. 2nd edition. Oxford, UK, Wiley Blackwell. 329 pp.

69.- Kubica, T., Agzamova, R., et al., 2006. Mycobacterium bovis isolates with M. tuberculosis, specific characteristics. Borstel, Germany, National Reference Centre for Mycobacteria; Almaty, National Centre for Tuberculosis Problems; and Geneva, WHO.

70.- Persistent spores reside in the soil.

71.- Except for dog meat in Southeast Asia.

Commercial imports that travel directly to the centre of Kazakhstan constitute a potential risk. The Veterinary Law foresees the establishment of border control posts, with inspection at these posts. Several stakeholders (including insiders) reported that meat is smuggled to evade the payment of import duties and VAT. Such consignments are also likely to have escaped the attention of border veterinary staff, although it seems that smuggling has been largely if not fully contained. A specific risk in the short term concerns African swine fever, which has entered the Russian Federation from Georgia.

A series of conferences has been held to define a common regional approach to transboundary diseases. Although the countries south of Kazakhstan continue to pursue vaccination strategies, Kazakhstan tends to opt for non-vaccination in combination with intensive monitoring. Non-vaccination policies generally create the risk that disease returns, while vaccinations can cause a sero-positive reaction when testing for the disease. It is easier to export meat from animals that are not sero-positive owing to vaccination.

Effectiveness of anti-epizootic measures

To contain outbreaks of disease, the Veterinary Department has deployed the Republican Anti-Epizootic Detachment, which has been quite effective, as demonstrated by the rapid disappearance of FMD in 2007. It is hoped that similar effectiveness can be achieved under the planned decentralization.

The large size of Kazakhstan makes a regional approach to the control of epizootics relevant. There are permanent police control posts between oblasts, which can be engaged for the control of livestock movements in case of disease outbreak. In accordance with OIE recommendations, Kazakhstan distinguishes the following zones:

- disease-free zones without vaccination;
- zone subject to monitoring;
- disease zone with vaccination;
- buffer zone;
- problematic (unsafe) zone.

These zones are also stages in the progression towards recognized disease-free status. For sero-monitoring the Veterinary Department has acquired 18 units of enzyme linked immunosorbent assay (ELISA) equipment.

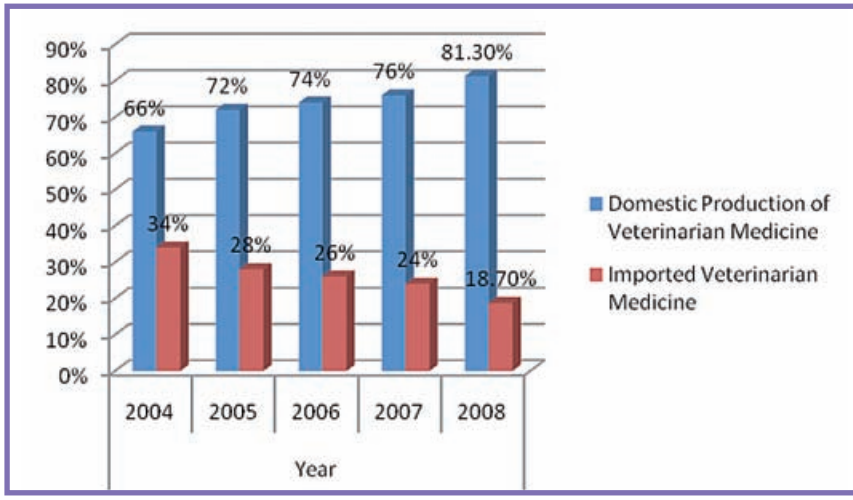
Provisions for animal health products

Drugs and other animal health products can be imported or produced if they are registered on the National Register of Veterinary Drugs, Feeds and Feed Additives for 2009. This list contains a wide range of items, including vaccines produced outside Kazakhstan.

To implement effective control, the Chief State Veterinary Inspector has to ensure good collaboration with border agencies (Customs and the Ministry of Trade). It is also necessary to take samples in the field and to engage a laboratory that can test the drugs to ensure that the labels are not falsified. For this, the department can collaborate with recognized drug manufacturers.

A steady increase has been observed in the share of domestic products in the market for veterinary diagnostic products, reaching 80 percent in 2008 (Figure 17). This improved performance may reflect recent State policy, which has attempted to ensure that production techniques comply with international good management practice (GMP) and International Organization for Standardization (ISO) standards. In Kazakhstan there are currently 11 legal entities producing veterinary pharmaceuticals and reagents for diagnostics and preventive measures.

Figure 17: Increasing share of domestically produced veterinary pharmaceuticals in the market



Source: MoA Department of Livestock Sector Development and Veterinary Safety.

Safety levels of food and raw materials of animal origin

The Food Safety Law was last updated on 21 July 2007. It defines the general framework for food safety regulation, gives precedence to international treaties, and assigns responsibilities among government sectors and divisions (veterinary authorities and oblasts). Article 11 states that actors (producers) must, among other things, control the safety of each batch; stop the process in the event of a hazard, and initiate a call-back; and ensure the traceability of food products.

Adoption of the Veterinary Law amendments (of 27 July 2009) is a further step towards bringing safety standards up to the international level. This law provides for:

- a central responsible (competent) authority for all matters concerning the safety of food from animal origin;
- an animal identification system on which product traceability can be based; however, the necessity and sustainability of such a system are doubtful in current circumstances; easy movement of

animals across the borders with neighbouring countries would require a regional approach to animal identification (for which international organizations' acknowledgment and support would be obtained); and the capital and recurrent costs required are too high given the potential benefits of the proposed system;

- sero-monitoring and other monitoring of infectious diseases;
- sampling of animal tissues and animal products;
- standards for slaughterhouses, processing units and transport;
- maintenance of a centralized inspection system;
- border control;
- a laboratory service for analysing samples;
- a list of permitted drugs and applications;
- professional standards for veterinary staff.

Standards for establishments for slaughter, processing and transport: Parallel and complementary to the Veterinary Law, five technical regulations concerning the safety of food products have been elaborated based on the Law on Technical Regulation of 9 November 2009. This has been a joint effort of the Ministries of Agriculture, of Health and of Industry and Trade.[72] One objective is to harmonize standards before joining WTO. If the regulations refer to a specific standard, that standard becomes obligatory. Other standards are voluntary.

The regulations principally describe the required design of slaughter facilities, the preparation for slaughter, and the precautions for slaughter and packing. They also require good control of the manufacturing process, but do not specifically state that meat must be traceable to an animal or batch of animals. However, article 11 of the Food Safety Law makes this obligatory.

Regarding drugs and residues, the regulation refers to the veterinary regulation(s). It is presumed that this is the list of maximum residue levels, which should therefore match available laboratory capacity. Laboratories already exist, and a new top-level residue laboratory is planned, which will also be used to train staff. A summary of safety measures for meat is given in Table F.2.

72.- With support from the World Bank-funded ACP.

The difficult part of implementing the Veterinary Law and the Technical Regulation for Meat is that they oblige all livestock to be slaughtered in approved abattoirs and under veterinary supervision. This counters existing customs and practices, including tax avoidance. It will also be physically and logistically difficult to implement an animal identification system in full, especially for sheep that spend most of the time moving around in distant fields.

Table F.2: Implementation of a food safety system for meat

Item	Present status
Legal framework	Enacted
Regulatory framework	Processing: enacted Veterinary: pending
Border control	Weak owing to smuggling
Disease control	Fair to fragile. FMD contained but requires monitoring. TB, brucellosis and rabies not fully controlled and pose risk of resurgence
Disease monitoring	Increasing capacity (ELISA) and laboratories
List of permitted drugs and control on drug	List exists. Control of compliance requires strengthening
Chemical residue monitoring	Reference laboratory under construction.
Nuclear residue monitoring	Does not appear to be included in present planning
Animal identification	Not yet; detailed regulation pending
Approved slaughterhouse and meat transport network	Only a few establishments approach the standards
Certification of meat for export	The authority exists, but administrative and sampling procedures are not routine

Poultry-specific epizootic disease situation

Table F.3 summarizes Kazakhstan's notifications of poultry disease incidences to WAHID. In the past, questions have been raised regarding the full transparency of Kazakhstan's reporting system.

Table F.3: Poultry disease situation in Kazakhstan, WAHID Interface, OIE

Total number of cases/outbreaks reported on OIE database					
	2005	2006	2007	2008	2009
Being researched by KZK MoA, Nov'09					
Highly Pathogenic Avian Influenza	1 (July)	1 (Mar)	0	0	0
Newcastle Disease	0	0	0	0	0
Marek's Disease	0	0	0	0	0
Infectious Bursal Disease (Gumboro)	0	0	0	0	0
Avian Infectious Laryngotracheitis	0	0	0	0	0
Fowl Pox	0	0	0	0	0
Common in similar countries					
Avian Mycoplasmosis (M. synoviae)	0	0	0	0	0
Avian Mycoplasmosis (M. gallisepticum)	0	0	0	0	0

The only reported disease incidences from Kazakhstan were outbreaks of HPAI in July 2005 and March 2006. The 2005 outbreaks were in the oblasts of North Kazakhstan, Akmolinsk, Pavlodar and Karaganda. In 2006, HPAI was identified in swans in Mangystau oblast. Nevertheless, researchers interviewed by the study team at the Scientific Centre for Animal Husbandry and Veterinary in Almaty were researching vaccines for each of the disease entities in Table F.3.

According to MoA information (2009), in response to past HPAI outbreaks, and as an indication of Kazakhstan's commitment to controlling future risks, almost 500 dynamic response headquarters have been created across the country. Disease risk communication programmes have involved more than 6 000 village gatherings in more than 7 000 communities, nearly 200 reports in the local press, and the distribution of more than 15 000 posters, 90 000 hand-outs and 82 000 booklets. Almost 8 000 serum samples have been analysed, with negative results. During 2009, 7 million birds across Kazakhstan were vaccinated against HPAI, approximately half of these being from HHFs.

A proactive programme for the vaccination of smallholder and village birds against HPAI has been established, although some authorities have questioned the effectiveness of this approach. There is also a system of serological monitoring of local and wild birds.

However, for Kazakhstan to become internationally competitive in the poultry products trade, it must achieve freedom from HPAI status with OIE. To do this, a full OIE-approved HPAI biosecurity plan must be put in place as soon as possible, including a coordinated approach by veterinary authorities, local and central government and the internal security services (police and army). A full contingency plan must be drawn up, and all of this must be supported by a compensation plan. The key weakness in most countries' biosecurity plans is the lack of compensation for notifiable diseases. When there is a slaughter policy for eliminating the disease, but no compensation plan, neither commercial enterprises nor smallholders are likely to report disease outbreaks. The World Bank has been providing financial support to the development of an HPAI plan 2004.

In association with the existing MoA control of State veterinary services through the Department of Livestock Sector Development and Veterinary Safety, a veterinary reference laboratory should be established in Kazakhstan for the internationally accepted diagnosis of HPAI in poultry and wild bird species, together with an improved range of diagnostic procedures, and a methodology for developing vaccines against a variety of other poultry epizootic diseases of concern. The ongoing World Bank ACP has achieved good progress in establishing a national agricultural reference laboratory, which is expected to be completed in the near future.

A key issue for Kazakhstan is the very large volumes of backyard poultry found in rural areas. Although an accurate assessment of the risks posed by household flocks is not feasible, this scale of backyard poultry in other countries generally poses challenges regarding disease control, biosecurity and public health. Newcastle disease is commonly a key risk for the backyard sector, as is avian influenza, as many of these poultry are free-range, and its geographic positioning makes Kazakhstan a haven for resident and migrating wild bird populations. It is located directly under the Central Asia flyway, and has its western and eastern borders under the East Africa to West Asia and the Black Sea to Mediterranean flyways respectively.

OIE control of HPAI and Newcastle disease: In recent years, the rapid spread of the current HPAI strain (H5N1) to many countries has created considerable alarm and serves as a reminder of the threat to the

Kazakh broiler and egg laying industries. The OIE strategy, in collaboration with FAO and WHO (2007), focuses on eradicating the animal source through early detection, early warning, rapid confirmation of suspect cases, rapid response, and rapid and transparent notification. The main goal is to reduce the virus load and circulation in poultry and the spread to unaffected areas or countries, thereby also decreasing the risk of human infections or the development of a human pandemic virus. High-quality veterinary services complying with OIE standards, legislation and a clear national chain of command are the basis for animal disease control and eradication.

Newcastle disease is endemic in many parts of the world, and is an important differential diagnosis for HPAI, as the two diseases cannot be differentiated clinically. Most areas affected by HPAI are also affected by endemic Newcastle disease with high mortality in poultry. Many countries, including Kazakhstan, have expressed an interest in introducing the concepts of zoning and compartmentalization for control of these two important diseases (although these concepts are more relevant for exporting countries).

Effectiveness of anti-epizootic measures: MoA funds allocated to State veterinary activities across all animal species in 2008, were three times – or T 8 billion – higher than in 2004. Although probably not reflecting the poultry situation, the number of reported outbreaks of epizootic diseases in all animal species fell by 163 cases in 2008, to a third of its 2004 level. The production of veterinary drugs in Kazakhstan increased by 15.3 percent, accounting for 81.3 percent of the total market for veterinary preparations (MoA, 2009)[73]. Regarding the importance of biosecurity measures in keeping the country free of HPAI, the likely cost to the Kazakh economy of a serious outbreak of HPAI was calculated (OIE, 2007)[74] at about USD20 million, using a simulation.

73.- MoA (2009): Department of Livestock Sector Development and Veterinary Safety, Ministry of Agriculture of the Republic of Kazakhstan. Database accessed by the Analytical Centre for Economic Policy in Agricultural Sector, Astana, Kazakhstan. December, 2009.

74.- OIE (2007): World Organisation for Animal Health (OIE). Prevention and control of animal diseases worldwide. Economic analysis - Prevention versus outbreak costs. Final Report, Part I, September 2007.

Although there is considerable debate over this issue, the researchers for the OIE report pointed out that the indirect or longer-term impacts of HPAI disease outbreak (such as loss of consumer confidence, and repercussions on trade and tourism) are generally regarded to be greater than the direct or shorter-term impacts. In global macroeconomic terms, the direct impact may be relatively modest, but for the rural economy, or at the microeconomic level of the individual farmer, the impact can be substantial given that affected farmers in most developing countries have few other sources of income and the sector is of fundamental importance for rural livelihoods and their survival. In this case, serious poverty alleviation and food security concerns enter the equation.

ANNEX 1: REFERENCE TABLES

Table 1: Numbers of farms and animals, by category, over recent years and in 1990

Numbers of farms and livestock per category of farm						
End of year	1990	2004	2005	2006	2007	2008
Farms						
State farms	2 223	82	65	65	79	25
Other AEs	2 371	4 430	4 919	5 224	5 203	5 145
Total enterprise	4 594	4 512	4 984	5 289	5 282	5 170
PFs	324	148 001	156 978	167 843	169 362	169 481
HHFs	2 094 000	2 134 000	2 133 000	2 194 000	2 207 000	2 232 000
Cattle						
AEs		345	332	324	319	321
PFs		418	476	572	635	720
HHFs		4 441	4 650	4 765	4 887	4 967
Total	9 757	5 204	5 457	5 660	5 841	6 008
Sheep and goats						
AEs		910	866	857	871	903
PFs		2 153	2 639	3 269	3 585	4 183
HHFs		10 345	10 830	11 224	11 624	11 852
Total	35 660	13 409	14 335	15 350	16 080	16 938
Horses						
AEs		66	64	67	70	79
PFs		155	184	226	255	298
HHFs		900	916	942	966	989
Total	1 616	1 120	1 164	1 236	1 291	1 366
Pigs						
AEs		160	166	190	196	196
PFs		66	70	88	91	100
HHFs		1 067	1 046	1 027	1 066	1 089
Total	3 224	1 292	1 282	1 305	1 353	1 384
Pou try						
AEs		11 869	12 220	14 586	15 066	15 542
PFs		302	375	346	348	329
HHFs		13 435	13 621	13 308	14 093	14 816
Total	59 900	25 606	26 216	28 239	29 507	30 687

Source: Statistics Agency.
Note: Camels are not shown. Their number is about 160 000. The majority (130 000) are kept on HHFs, which also keep ducks and geese

Table 2: Distribution of size classes of herds, by region, 2008

(Percentage of number of farms with animals and of total livestock)

A. Peasant farms: Cattle

	Total farms	Farms with cattle	Up to 10 head		10–50 head		50–100 head		100 head and more	
			% farms	% head	% farms	% head	% farms	% head	% farms	% head
Kazakhstan	193 855	16 155	20.5	2.4	53.8	28.4	16.0	24.0	9.7	45.2
Akmola	4 726	83	3.6	0.2	39.8	9.9	25.3	18.2	31.3	71.7
Kostanai	6 260	136	2.9	0.2	45.6	14.2	26.5	21.4	25.0	64.2
Pavlodar	3 644	712	7.2	0.6	49.0	17.4	24.1	21.9	19.7	60.1
North	3 701	58	6.9	0.3	36.2	7.1	24.1	12.9	32.8	79.7
North	18 331	989	6.3	0.5	47.0	15.7	24.5	21.0	22.2	62.8
East	16 651	2 831	14.4	1.5	57.7	26.4	17.6	21.8	10.3	50.3
West	4 360	1 449	22.5	2.2	49.5	22.3	15.1	20.1	12.9	55.4
Karaganda	6 662	2 311	25.1	3.7	54.6	34.4	13.2	24.8	7.1	37.1
Aktobe	4 857	754	20.0	2.3	53.7	30.6	15.4	22.6	10.9	44.5
Steppe	15 879	4 514	23.4	3.0	52.8	29.9	14.2	22.9	9.6	44.2
Almaty oblast	51 608	4 116	14.0	1.6	54.4	27.9	20.2	28.1	11.4	42.4
South	69 478	769	32.4	4.5	46.6	29.1	13.8	26.6	7.2	39.8
Zhambyl	15 930	1 148	26.9	4.7	58.5	44.0	10.7	24.4	3.9	26.9
South	137 016	6 033	18.8	2.6	54.2	31.1	17.6	27.2	9.4	39.1
Atyrau	2 041	1 168	33.5	7.6	55.9	52.0	8.5	25.0	2.1	15.4
Kyzylorda	2 650	378	25.9	3.5	54.0	37.0	11.6	22.8	8.5	36.7
Mangistau	1 200	240	66.3	35.2	32.9	60.1	0.8	4.7	0.0	0.0
Desert	5 891	1 786	36.3	10.4	52.4	49.9	8.1	21.8	3.2	17.8
Astana city	16	1	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0
Almaty city	71	1	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0

B. Agricultural enterprises: cattle

Kazakhstan	7 217	849	8.7	0.1	26.0	1.8	12.1	2.3	53.2	95.8

C. Peasant farms: sheep and goats

	Total farms	Farms with sheep and goats	Up to 100 head		100–500 head		500 head and more	
			% farms	% head	% farms	% head	% farms	% head
Kazakhstan	193 855	14 526	43.0	6.2	40.5	34.7	16.5	59.1
Akmola	4 726	67	44.7	11.2	46.3	54.4	9.0	34.4
Kostanai	6 260	104	41.3	11.2	52.9	60.0	5.8	28.8
Pavlodar	3 644	642	51.7	10.4	39.1	43.8	9.2	45.8
North	3 701	38	52.7	13.0	36.8	42.2	10.5	44.8
North	18 331	851	49.9	10.7	41.3	46.5	8.8	42.8
East	16 651	2 791	32.7	4.1	45.1	33.3	22.2	62.6
Aktobe	4 857	707	46.5	7.5	37.8	34.4	15.7	58.1
West	4 360	1 202	64.1	13.8	28.1	41.6	7.8	44.6
Karaganda	6 662	2 010	52.3	9.0	35.9	42.2	11.8	48.8
Steppe	15 879	3 919	54.9	10.2	33.9	40.6	11.3	49.2
South	69 478	398	16.3	1.2	43.8	13.7	39.9	85.1
Almaty oblast	51 608	3 614	40.3	5.9	41.7	34.3	18.0	59.8
Zhambyl	15 930	1 227	21.6	2.8	57.3	36.8	21.1	60.4
South	137 016	5 239	34.1	4.8	45.5	33.3	20.4	61.9
Kyzylorda	2 650	284	58.8	9.5	29.2	281.0	12.0	62.4
Mangistau	1 200	533	36.2	6.7	46.9	41.5	16.9	51.8
Atyrau	2 041	908	66.4	16.2	26.8	39.3	6.8	44.5
Desert	5 891	1 725	55.8	12.2	33.4	79.8	10.8	49.7
Astana city	16	0	0.0	0.0	0.0	0.0	0.0	0.0
Almaty city	71	1	100.0	100.0	0.0	0.0	0.0	0.0

D. Agricultural enterprises: Sheep and goats

Kazakhstan	7 217	594	20.0	0.7	35.9	6.5	44.1	92.8

Table 3: Year-on-year growth of livestock numbers, by farm type

End of year	1990	2004	2005	2006	2007	2008
Cattle						
AEs			-4%	-2%	-1%	1%
PFs			14%	20%	11%	13%
HHFs			5%	2%	3%	2%
Total		6,8%	5%	4%	3%	3%
Sheep + Goats						
AEs			-5%	-1%	2%	4%
PFs			23%	24%	10%	17%
HHFs			5%	4%	4%	2%
Total		9,5%	7%	7%	5%	5%
Horses						
AEs			-3%	5%	4%	12%
PFs			19%	23%	13%	17%
HHFs			2%	3%	2%	2%
Total		5,3%	4%	6%	4%	6%
Pigs						
AEs			4%	14%	3%	0%
PFs			6%	26%	3%	10%
HHFs			-2%	-2%	4%	2%
Total		-5,6%	-1%	2%	4%	2%
Poultry						
AEs			3%	19%	3%	3%
PFs			24%	-8%	1%	-6%
HHFs			1%	-2%	6%	5%
Total		3%	2%	8%	4%	4%

Note: Data for November 2009 (not shown) indicate that the growth trends are continuing and in some cases may be accelerating.

Table 4: Numbers of livestock, by oblast and zone

Oblast and zone	Cattle	Sheep and goats	Pigs	Horses
South Kazakhstan Oblast	716	3415	33	144
Almaty Oblast	791	2946	142	220
East Kazakhstan Oblast	766	2173	91	184
Zhambyl Oblast	321	2193	38	83
SOUTH AND EAST	**2593**	**10727**	**304**	**631**
Aktobe Oblast	447	1073	68	69
Karaganda Oblast	413	963	102	129
West Kazakhstan Oblast	439	770	26	61
STEPPE	**1299**	**2806**	**196**	**259**
Kostanay Oblast	557	325	302	80
Akmola Oblast	404	330	195	91
Pavlodar Oblast	360	475	96	77
North Kazakhstan Oblast	352	247	248	89
NORTHERN CROP	**1672**	**1376**	**840**	**337**
Atyrau Oblast	172	580	3	42
Kyzylorda Oblast	245	781	4	61
Mangystau Oblast	10	501	1	41
DESERT	**428**	**1862**	**8**	**144**
Kazakhstan	**5778**	**15840**	**1343**	**1299**

Source: Statistics Agency data for 1 January 2009.
Camels are not mentioned. They occur primarily in the last three oblasts (the desert zone).

Table 5: Estimated investment costs, feedlots and slaughterhouses

Project	Location	Head/ capacity	Investment T	Investment USD	Per 2 500 USD
FEEDLOT INVESTMENT COSTS					
Infrastructure		2 500			1 127 435
Equipment					562 800
Working capital					1 593 246
Subtotal					3 283 481
Slaughterhouse (carcasses)					
Mal Onimderi,	Almaty				
Total					
Infrastructure		10 000	1 644 000 000	11 108 108	2 777 027
Equipment			364 000 000	2 459 459	614 865
Working capital			900 000 000	6 081 081	1 520 270
Subtotal			2 908 000 000	19 648 649	4 912 162
Slaughterhouse (carcasses)			740 000 000	5 000 000	
K*	Kostanay	2 000	344 000 000	2 324 324	2 905 405
SC*	Pavlodar	6 000	1 853 000 000	12 520 270	5 216 779
P*	Pavlodar	3 000	845 000 000	5 709 459	4 757 883
A*	Pavlodar	2 500	650 000 000	4 391 892	4 391 892
KA*	Almaty	3 600	594 000 000	4 013 514	2 787 162
B*	Pavlodar	5 000	1 300 000 000	8 783 784	4 391 892
PA*	North K	5 000	1 500 000 000	10 135 135	5 067 568
Model ACC, all in feedlot for reproduction*					
Construction		5 000	400 000 000	2 702 703	1 351 351
Equipment			325 000 000	2 195 946	1 097 973
Animals		1 100	325 000 000	2 195 946	1 097 973
Working capital			206 000 000	1 391 892	695 946
Subtotal					4 243 243
SLAUGHTERHOUSES					
Slaughterhouse min. 5 animals/day	Building	1 500	4 100 000	27 703	
	Equipment	1 500	14 500 000	97 973	
Slaughterhouse Karaman farm**		20/day	340 400 000	2 300 000	
MEAT PACKING PLANTS					
Sketch in this report		5000 tonnes/yr			
Construction			187 960 000	1 270 000	
Equipment			150 960 000	1 020 000	

Project	Location	Head/ capacity	Investment T	Investment USD	Per 2 500 USD
Transport (freezer lorries)			177 156 000	1 197 000	
			516 076 000	3 487 000	
Meat packing plant model AAC	building+ engineering	26 550	800 000 000	5 405 405	
(proposed 4 units: 2 in Pavlodar, 1	equipment		400 000 000	2 702 703	
Kostanai, 1 North Kazakhstan)	w-capital		366 000 000	2 472 973	
				10 581 081	
Astana Agroprodukt	Pavlodar	5000/ tonnes	700 000 000	4 729 730	
K*	Kostanay	6600 tonnes	1 444 000 000	9 756 757	
SC*	Pavlodar	4 tonnes/ day	853 800 000	5 768 919	
Packing and processing plant					
Apple City Food**		5000 tonnes	4 736 000 000	32 000 000	

Sources: * ACC presentation (initials only). ** As claimed by owners/managers.

Table 6: Simulation assumptions ACC feedlot model

(with optimistic assumptions)

		2009	2010	2011	2012	2013	2014	2014	2016	2017	2018	2019	2020	2021	2022
		number of tons													
Cow		1100	1085	1507	1737	1935	2005	2045	2031	2024	2035	2027	2028	2029	2027
Cows		15	15	200	400	620	728	810	818	796	812	806	804	808	804
Female		485	478	664	766	853	884	902	896	893	897	894	895	895	894
Male		485	478	664	766	853	884	902	896	893	897	894	895	895	894
Male sales (98% x weaned)			475	469	651	751	836	866	884	878	875	879	876	877	877
Males in farm		485	641	890	1026	1143	1184	1208	1200	1196	1202	1197	1198	1199	1197
Heifers in farm		485	957	1329	1532	1707	1768	1804	1791	1786	1795	1788	1789	1790	1788
Heifers calving (90% x weaned)				437	431	598	690	768	796	812	806	804	808	804	805
Head of stock in farm		2070	2683	3725	4296	4785	4957	5056	5022	5006	5032	5012	5016	5018	5012
Sales males		0	130	128	178	205	229	237	242	240	239	241	240	240	240
Sale heifers cull (10% weaned)				10	10	13	15	17	18	18	18	18	18	18	18
Sale cows cull *98%				61	123	190	224	249	251	244	249	248	247	248	247
Sum sales, tonnes			130	199	311	409	468	503	511	503	507	506	504	506	505

		2009	2010	2011	2012	2013	2014	2014	2016	2017	2018	2019	2020	2021	2022
		KZT millions													
Return mln. T			60	92	143	188	215	231	235	231	233	233	232	233	232
Subsidy return			23	35	54	72	82	88	89	88	89	89	88	89	88
Operations expense after yr 1 (variable)		0	80	112	129	144	149	152	151	150	151	150	150	151	150
Loans service															
	cost million T														
Initial project cost	1461														
% loan and loan (% = variable in model)	85%	1242	1242	1242	1111	980	850	719	588	458	327	196	65	0	
Repayment	1242	0	0	131	131	131	131	131	131	131	131	131	65	0	
Interest 6%		75	75	75	67	59	51	43	35	27	20	12	4	0	
Total debt service		75	75	205	197	190	182	174	166	158	150	142	69	0	
Cash flow for investor		downpay													
Downpay + secondary investment	724	219	72	190	129	73	33	6	0	0	0				
Return+ subsidy loan service - operations		-219	-72	-190	-219	-73	-33	-6	8	11	20	29	101	171	170
Final value : 50% hardware, 100% x livestock															806
Total		-219	-72	-190	-129	-73	-33	-6	8	11	20	29	101	171	977
IRR	percent	6%													

Note: The crucial variable is the level of operations expenses after year 1 . When it is above about T 35 000/head/ year the project becomes unfeasible as an investment project.

This means that a large proportion of the feed has to consist of inexpensive

Table 7: Annual allocation of the livestock improvement subsidy fund for 2009

Oblast	Expenses ('000 T)						
	Beef	Wool	Pork	Pou try	Eggs	Milk	Total
Akmola	95 520	0	27 048	24 750	364 000	179 300	690 618
Aktobe	83 610	0	4 312	36 300	143 000	42 108	309 330
Almaty	149 610	79 077	167 384	1 650 000	1 074 364	353 756	3 474 191
Atyrau	19 350	0	1 078	0	0	12 320	32 748
East	500 914	5 922	98 098	792 000	453 104	463 584	2 313 622
Zhambyl	22 680	41 031	24 892	0	52 000	23 263	163 866
West	165 900	2 820	26 564	0	100 100	17 182	312 566
Karaganda	172 260	0	161 406	330 000	418 600	95 480	1 177 746
Kyzylorda	0	0	0	0	0	12 364	12 364
Kostanai	258 300	0	10 682	6 600	346 504	293 700	915 786
Pavlodar	180 000	0	220 304	0	219 104	246 469	865 877
North	204 912	0	211 876	46 200	234 000	340 316	1 037 304
South	13 050	21 150	36 456	55 506	208 000	26 400	360 562
Total	**1 866 106**	**150 000**	**990 100**	**2 941 356**	**3 612 776**	**2 106 242**	**11 666 580**

Table 8: Location and condition of hayfields (areas in '000 ha)

Oblast	Area	Require drastic improvement	Qualification			
			Pure	Bushy or forest	Poisonous plants	Hilly
AKMOLA	263	9.1	232	8.4	0.3	13.9
AKTOBE	313	0	304	5.3	3.9	0.2
ALMATY REGION	468	6.6	442	2.8	14.5	2.2
ATYRAU	133	0	126	0.5	5.4	0.4
EAST KAZAKHSTAN	1039	0	895	78.4	8.5	57,7
JAMBYL	231	4.7	225	0.9	31.7	0
WEST KAZAKHSTAN	1227	11.7	1164	1.5	0.4	17.7
KARAGANDA	385	0.4	372	4.1	5.1	8.7
KYZYLORDA	117	0	108	1.5	0.4	1.3
KOSTANAY	349	15.5	306	7.2	0	19.8
MANGISTAU	0.3	0	0.3	0	0	0
PAVLODAR	302	0	271	20.7	0	7.5
NORTH KAZAKHSTAN	42	13.3	29	3.6	0	0.3
SOUTH KAZAKHSTAN	143	1.9	124	3.3	13.7	0
ALMATY TOWN	3	0	0	0	0	0
TOTAL	**5015.3**	**63.2**	**4598.3**	**138.2**	**83.9**	**136**

Source: Torehanov, A.A., Alimayev, I.I. and Orazbayev, S.A. 2008. Meadow pasture forage production, p. 396

Table 9: Haymaking equipment

Equipment for a PF selling most of the hay or working on contract for others					
SET UP AND INVESTMENT COST PER UNIT					**Cost T**
Capacity of processing 6 ha or 10 tonnes hay per day					
For 50 workable days: total of 300 ha, 500 tonnes		1.67	tonne/ha		
	Tractors are hired/available				
1	disc mower , 2 m width		1.5	ha/hr	1 320 000
1	rake 3 m width		3	ha/hr	1 320 000
	Subtotal basic set				2 640 000
	Note: the farmer mows each day 5 hrs - 6 ha				
	Uses rake 2.5 hrs - 6 ha				
	Uses rake for turning yesterday's field 2.5 hrs 6 ha				
	Hay sold in field, for collecting by buyers				
	Step 2 - Hay is baled				
1	Small baler (1 000 15-kg bales/day) cost				4 400 000
ECONOMICS FOR USER		**Unit**	**Quant ty**	**Price**	**Cost, T**
	Step1 : basic haymaking				
	Set basic equipment			2 640 000	
	Interest			4%	105 600
	Depreciation			8%	211 200
	Maintenance			5%	132 000
	Tractor hire	hour	500	600	300 000
	Fuel	litre	2500	100	250 000
	Total				998 800
	Product = hay in field for collection	tonne	450	5 000	2 250 000
	Margin for work and tax				1 251 200
	Gross income per day of hard work				25 024
	Optional step 2: baling of the hay				
	Baler			4 400 000	
	Interest			4%	176 000
	Depreciation			8%	352 000
	Maintenance			4%	176 000
	Tractor hire (60-70 HP)	hour	240	600	144 000
	Baling twine	roll	50	3 570	178 475
	Fuel	litre	1440	100	144 000
	Total				1 170 475
	Added value = baled in field	tonne	450	4 500	2 025 000
	Margin for work and tax				854 525
	Gross Income per day of hard work				28 484
	Sales price of baled hay in field			9 500	
	Note: (market prices for baled hay vary from 5 600 to 11 500)				
INVESTMENT COUNTRY-WIDE OVER 10 YEARS					
	3 million ha grass to cut				
	One basic unit is for 300 ha. Thus 10 units needed.				
	One hay baler is for about 400 ha, about 1 million ha (30%) in bales , thus 2 500 units needed				
				T	**'000 T**
	Basic unit	set	10000	2 640 000	26 400 000
	Balers	unit	2500	4 400 000	11 000 000
	Extra tractors (partially for hay)	unit	1000	6 600 000	6 600 000
	Total				44 000 000
	Per year			10%	4 400 000

Table 10: Commercial feed mills in Kazakhstan

Region	Business Name or district	Actual Prod'n Tonnes per year	Design Capacity Tonnes per year	Equipment, and date commissioned	Major Customers
Almaty	Balkhash	900	7,500	France, 7500, 2003	Internal needs of Corporation LLP Atil.
Almaty	Yenbekshikazakh	24,198	50,000	789 H "Sipma", Bulgaria, 2002	Poultry Farm Almaty Kus "
Almaty	Zhambyl	19,025	30,000	789 H "Sipma", Bulgaria, 2500 tons / hour, 2002	Internal needs for LLP RubiRozAgrikol "
Almaty	Ili	10,504	10,000	Domestic and Russia, Company "Willer", 2001	Internal needs of JSC "Bent"
Almaty	Talgarsky	10,800	15,000	"Crusher", Holland	Internal needs LLP "Bacon"
Almaty	Kapshagai	38,100	86,000	Russian	LLP AdilAgro "
Aqmola - Astana	LLP "Concern Tsesna-Astyk	90,000	120,000	Russian	Agricultural enterprises, poultry farms
Aqmola	JSC "Progress Agro"	18,000	64,000	Russian	Poultry, pig
Aqmola	LLP Agrovit "	4,500	6,000	Russian	Agricultural enterprises, poultry
Aqmola - near Astana	PC "Izhevsk"	15,000	21,000	Russian	Internal needs
Atyrau	LLP "Seaside Elevator"			"Anafood", Turkey, 2005	Not operational
Aktyubinsk	JSC "Ak-kus"	1,272	10,560	Germany firm "Big Dutchman", 2005	Internal needs, egg productiion
East Kazakhstan	LLP "Ust-Kamenogorsk feed mill"	25,000	126,000	USSR, 1972	LLP "Ust-Kamenogorsk Fodder" (NOT UKPF)
East Kazakhstan	LLP "Semipalatinsk feed mill"	50,000	276,000	Germany, Russia, Hungary, 1967	LLP Coos Families "," PBPF "," Bird Tribe "

Western Kazakhstan	Aksay CCP	14,000	105,000	Czechoslovakia, 153,300 tons per year, vyp.1980	Agricultural enterprises
Zhambyl	LLP "BM"	33,971	36,000	"Samat", France, 2002, "Promill", Germany, 2002	Agroform. area and for export (Iran, Kyrgyzstan, Afghanistan)
Region	**Business Name or district**	**Actual Prod'n Tonnes per year**	**Design Capacity Tonnes per year**	**Equipment, and date commissioned**	**Major Customers**
Quaraghandy	LLP Aknar PF "	36,300	48,000	Line for production of fodder for "Tehneks" Ekaterinburg Manuf. 200 tons per day	LLP APC Volyn ", AO" A-Altyn LLP, Aknar PF "
Pavlodar	LLP Pavlodarzernoprodukt "	30,000	60,000	Manufacturer of equipment is unknown, year 1971	TOO Agrokombinat Dostyk
Pavlodar	LLP "Rubik"	17,000	21,000	Func. line pr-woo feed, China, 2007	LLP "Rubik"
Pavlodar	LLP NOKA "	70,000		Compact universal kombikorm.zavod, USSR, 1978	LLP NOKA "
Pavlodar	IP "Kairbaev"	15,000		Minikombikormovy plant, Russia, 2004	On request
North Kazakhstan	Tayynshinsky rn	200,000	210,000	"Amandus Kahl", Germany	Agricultural enterprises
Total		723,570	1,.302,060		
			56	% Current utilization	

Source: Ministyery of Agricolture Republic of kazakhstan, 2008

Note that, following Pak (2009), a minimum capacity of 4 000 to 5 000 tonnes of chicken meat production per year is often regarded necessary to justify the expense of building a privately operated feed mill.

Table 11: Requirements for meat producers and quality of products for qualification for subsidies

No.	Parameter	Unit	Value
	I. To producers at cattle enterprises* (level 1)*		
1.	Presence of own breed stock of cows (older than 2 yrs)	Head	> = 1000
2.	Of them – pedigree animals	%	90
3.	Number of fattening livestock (annual average at feedlot)	Head	> = 1000
4.	Presence of a modern feedlot with developed infrastructure		
5.	Presence of a modern slaughterhouse		
6.	Fattening cattle must take place throughout the year		
7.	Live weight of cattle (sold for slaughtering)**	kg	> = 380
8.	Fatness of cattle (sold for slaughtering)**		> = average
9.	Presence of own feed base		
10.	Good veterinary condition		
	II. To producers at cattle enterprises level 2)		
1.	Presence of own breed stock of cows (older than 2 yrs)	Head	> = 100
2.	Of them – 50% and more pedigree or cross-bred cattle		
3.	Number of fattening livestock (annual average at feedlot)	Head	> = 70
4.	Including own reproduction	%	> = 50
5.	Presence of specialized feedlot for cattle		
6.	Fattening cattle must take place throughout the year		
7.	Live weight of cattle (sold for slaughtering) **	kg	> = 350
8.	Fatness of cattle (sold for slaughtering) **		> = average
9.	Presence of own feed base		
10.	Good veterinary condition		
	III. To producers at cattle enterprises (level 3)		
1.	Presence of own breed stock of cows (older than 2 yrs)	Head	> = 70
2.	Number of fattening livestock (annual average at feedlot)	Head	> = 30
3.	Including own reproduction	%	> = 50
4.	Presence of specialized feedlot for cattle		
5.	Fattening cattle must take place throughout the year		
6.	Live weight of cattle (sold for slaughtering) **	kg	> = 350
7.	Fatness of cattle (sold for slaughtering) **		> = average
8.	Presence of own feed base		
9.	Good veterinary condition		
	IV. To producers at pig enterprises		
1.	Presence of basic and replacement sows	Head	50
2.	Of them – 50% and more pedigree or cross-bred pigs		
3.	Number of fattening livestock (annual average at feedlot)	Head	> = 100
4.	Including > = 80% own reproduction		
5.	Presence of specialized feedlot for pigs		
6.	Fattening pigs must take place throughout the year		
7.	Live weight of pigs (sold for slaughtering) **	kg	> = 90
8.	Fatness of pigs(sold for slaughtering) **	Not below V-category	
9.	Presence of feeds		
10.	Good veterinary condition		

* *Note:* The literal translation of "otkormochni komplex" is "feeding place for animals", which is more general than the usual meaning of "feedlot" – a facility for fattening slaughter animals.

Table 12: Sample of commercial broiler rations used by poultry enterprises in Kazakhstan in 2009

Ingredient	KZT:USD	150	Days 0-10		Days 11-20		Days 21-30		Days 31-40		
			Pre-Starter Ration		Starter Ration		Grower Ration		Finisher Ration		Ingredient
	KZT/Kg	USD/Tonne	Inclusion %	Cost contrib	Inclusion %	Cost contrib	Inclusion %	Cost contrib	Inclusion %	Cost contrib	Origin
				KZT/kg		KZT/kg		KZT/kg		KZT/kg	
Wheat	28,50	14,20	55,57%	15,84	57,38%	16,35	46,78%	13,33	48,07%	13,70	Kazak
Soybean Meal	89,28	44,48	23,00%	20,53	21,00%	18,75	14,00%	12,50	11,00%	9,82	Russia
Corn	31,25	15,57	10,00%	3,13	10,00%	3,13	10,00%	3,13	10,00%	3,13	Kazak
Barley	20,40	10,16		0,00		0,00	10,00%	2,04	12,00%	2,45	Kazak
Meat & Bone Meal	29,66	14,78	2,00%	0,59	3,00%	0,89	5,00%	1,48	5,00%	1,48	on-site rendering
Sunflower Oil	114,20	56,90	1,00%	1,14	2,00%	2,28	3,50%	4,00	4,50%	5,14	Kazak
Yeast	38,21	19,04		0,00		0,00	3,00%	1,15	3,00%	1,15	Kazak
Sunflower Meal 28%	17,90	8,92		0,00		0,00	3,00%	0,54	4,00%	0,72	Kazak
Fish Meal	118,30	58,94	6,00%	7,10	4,00%	4,73	2,00%	2,37		0,00	Latvia
Shell Lime	10,40	5,18		0,00	0,50%	0,05	0,90%	0,09	0,80%	0,08	Kazak*
Monophosphate	89,10	44,39	0,50%	0,45	0,50%	0,45	0,30%	0,27	0,40%	0,36	Kazak*
Lysine	535,70	266,92	0,20%	1,07	0,30%	1,61	0,20%	1,07	0,25%	1,34	Import
Methionine	790,30	393,77	0,25%	1,98	0,15%	1,19	0,15%	1,19	0,10%	0,79	Import
Premix Starter 1	403,90	201,25	1,00%	4,04		0,00		0,00		0,00	
Premix Starter 2	538,30	268,21		0,00	0,50%	2,69		0,00		0,00	

Ingredient	KZT:USD	150	Days 0-10		Days 11-20		Days 21-30		Days 31-40		
			Pre-Starter Ration		Starter Ration		Grower Ration		Finisher Ration		Ingredient
	KZT/Kg	USD/Tonne	Inclusion %	Cost contrib	Inclusion %	Cost contrib	Inclusion %	Cost contrib	Inclusion %	Cost contrib	Origin
				KZT/kg		KZT/kg		KZT/kg		KZT/kg	
Premix Grower	588,70	293,32		0,00		0,00	0,50%	2,94		0,00	Import
Premix Finisher	462,70	230,54		0,00		0,00		0,00	0,50%	2,31	
Sal Karb	419,64	209,09	0,10%	0,42		0,00		0,00		0,00	
Acidlac	687,50	342,55		0,00	0,20%	1,38	0,20%	1,38		0,00	Import
Soda	62,50	31,14	0,10%	0,06	0,10%	0,06	0,10%	0,06	0,10%	0,06	Kazak*
Salt	15,00	7,47		0,00	0,10%	0,02	0,10%	0,02	0,10%	0,02	Kazak
Fungizal	517,85	258,02	0,10%	0,52	0,10%	0,52	0,10%	0,52		0,00	Import
Betafin	1165,17	580,55	0,075%	0,87	0,075%	0,87	0,075%	0,87	0,075%	0,87	Import
Avitim 1500 K	818,00	407,57	0,05%	0,41	0,05%	0,41	0,050%	0,41	0,05%	0,41	Import
Avitim 1200	788,00	392,63	0,05%	0,39	0,05%	0,39	0,050%	0,39	0,05%	0,39	Import
Ave Ration Cost											
Ration Cost (KZT/kg)	52,06		100,00%	58,54	100,00%	55,76	100,00%	49,73	100,00%	44,22	
Ration Cost (USD/ Tonnes)	25,94			29,17		27,78		24,78		22,03	
DOF				10		10		10		10	
% Contribution to Ration Cost		*Soybean Meal*		35,1%		33,6%		25,1%		22,2%	

Table 13: Total poultry sector feed requirements compared with predicted supply of feedgrains and protein meals, current and projected, 2009

Kazakhstan 2009 Poultry Sector Feed Requirement vs Domestic Production (Tonnes/yr) + Future Projections for Broiler Enterprises						Additional Req't 2010-11
Total Poultry Sector Feed Commodity In Rations	2009 Commercial Broilers	2009 Commercial Layers	2009 Smallholder** Layer + Broiler	2009 Poultry Total	Feed Grains Supply 2009	Pending Finance Commercial Broilers
Wheat	98.891	233.086	308.179	640.155	6.000.000	272.211
Soybean Meal	30.903	68.220	0	99.124	55.000	85.066
Corn	20.602	85.275	56.032	161.910	375.000	56.711
Barley	20.602	56.850		77.452	1.500.000	56.711
Sunflower Meal	6.181	11.370	16.810	34.360	92.500	17.013
Fish Meal	6.181	22.740	0	28.921	All imported	17.013
Miscellaneous additives	22.662	90.960	40.343	153.966	Most imported	62.382
Bread Waste			138.961	138.961	unsure	
TOTALS	206.022	568.502	560.325	1.334.849	8.022.500	567.105

Note: Competition for available domestically produced feedgrains and protein meals must be expected from the dairy, beef, pig, sheep, horse and other livestock sub-sectors.

ANNEX 2: AVERAGE RAINFALL AND EVAPORATION

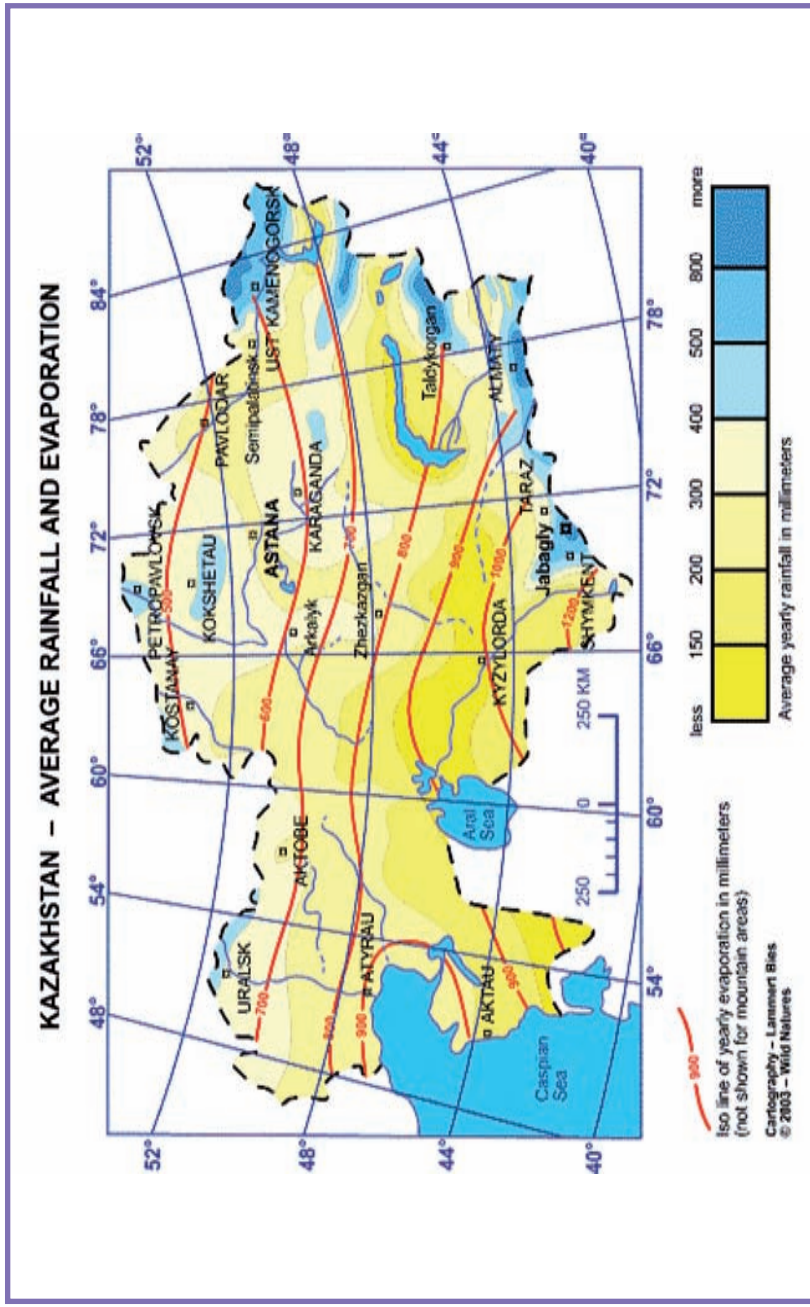

KAZAKHSTAN – AVERAGE RAINFALL AND EVAPORATION
PETROPAVLOVSK
KOSTANAY
KOKSHETAU
PAVLODAR
Semipalatinsk
UST KAMENOGORSK
ASTANA
KARAGANDA
Arkalyk
Zhezkazgan
Talcykorgan
KEMATY
TARAZ
Jabagly
SHYMKENT
KYZYLORDA
AKTOBE
URALSK
ATYRAU
AKTAU
Aral Sea
Caspian Sea
52°
48°
44°
40°
54°
60°
66°
72°
78°
84°
0
250
250 KM
less
150
200
300
400
500
800
more
Average yearly rainfall in millimeters
Iso line of yearly evaporation in millimeters
(not shown for mountain areas)
Cartography – Lammert Bies
© 2003 – Wild Natures

Figure 1

ANNEX 3:
ON TAXATION

Statistics Agency methodology for classification of farms

Agricultural enterprises (commercial farms) include State and other production formations (cooperative agricultural enterprises, partnerships, joint stock companies, agricultural firms, etc.), farms of enterprises and organizations.

Peasant farms are a form of free enterprises, which on the basis of lifetime inheritable possession or lease of land carry out the production, processing and marketing of agricultural products.

Household farmers are private landowners in the village, the property consisting of collective gardens and orchards, "*dachas*". Households are granted the land for use, possession and ownership for the production of agricultural products.

Tax Code regulations

Peasant and commercial farms can get some tax exemption. In order to get this they need to submit a special application to the rayon tax department.

Peasant farms are exempt from the following taxes:

(1) individual income tax (normally 10 percent);

(2) VAT (standard 12 percent);

(3) land tax (the amount varies, depending on the quality of the land, from T 43.42 to 202.65/ha);

(4) transport tax (this exemption applies to all agricultural producers for most machinery used for agricultural production);

(5) property tax (0.5 percent for small and 1.5 percent for big companies).

Instead they pay the unified land tax:

N°	Area, ha	Tax rate
1.	Up to 500	0.1 %
2.	501 – 1000	0.1% of estimated price of land up to 500 ha + 0.2% of land over 500 ha
3.	1 001 – 1 500	0.2% of estimated price of land up to 1 000 ha + 0.2% of land over 1 000 ha
4.	1 501 – 3 000	0.3% of estimated price of land up to 1 500 ha + 0.4% of land over 1 500 ha
5.	Over 3000	0.3% of estimated price of land up to 3 000 ha + 0.4% of land over 3 000 ha

Note: It appears that thus far there is no regulation on tax payment by peasant farmers when open pastureland is used.

Commercial farms and some agricultural cooperatives can get partial (70 percent) exemption from some taxes, as detailed in the following, if they comply with the following criteria:

- commercial farms that produce agricultural products with the use of land, process and sell the products made by themselves (i.e., not for resold products);
- commercial farms that produce livestock and poultry products (including breeding stock) with the full cycle (starting with growing young animals), and process and sell these products made by themselves;
- agricultural cooperatives that sell the agricultural products made by peasant farms, which are the shareholders of these cooperatives;
- agricultural cooperatives that process the agricultural products made by peasant farms, which are the shareholders of these cooperatives, and sell these processed products.

When compliant, commercial and cooperative farms are exempt for 70 percent of the following taxes:

- corporate income tax (normally 20 percent of net income);
- VAT (normally 12 percent);
- social tax (normally 11 percent of salary paid to labour);
- land tax;
- property tax;
- transport tax.

Source: Tax Code of the Republic of Kazakhstan.

ANNEX 4:
REGULATORY ASPECTS

Kazakhstan applied for accession to the World Trade Organization in January 1996. The country has gone through various steps of the WTO accession procedure. In practice, the procedure consists of multilateral negotiations taking place in a special working party, and in bilateral negotiations between the applicant and single WTO members. The main contentious issues concerning agriculture in these negotiations are the level of domestic support, and the elimination of export subsidies.

Although WTO is not an agricultural organization, a number of WTO agreements affect, in one way or another, trade in agricultural products. These agreements include: the General Agreement on Tariffs and Trade (GATT), the Agreement on Sanitary and Phytosanitary Measures (SPS), the Agreement on Technical Barriers to Trade (TBT); the Agreement on Agriculture; the Agreement on Subsidies and Countervailing Duties, the Agreement on Antidumping, and the Agreement on Safeguards. Collectively, these agreements reflect the binding commitments of WTO members.

Kazakhstan also maintains several preferential trade agreements, principally a bilateral free trade agreement with all CIS countries except Turkmenistan. Since 1 January 2010, Kazakhstan is a member of the Customs Union (CU) with the Russian Federation and Belarus. It is also a party to the Agreement on a Eurasian Economic Community (EAEC).

As Kazakhstan intends to boost agricultural exports and increase self-sufficiency in higher-value agricultural goods and foodstuffs, WTO requirements and international standards are likely to be a continuous determinant of Kazakh agricultural policies. The process of accession establishes the main task for the State to organize and carry out measures to ensure food safety on a qualitatively new level, in accordance with the SPS Agreement, Codex Alimentarius and the Terrestrial Animal Health Code of the World Organisation for Animal Health (OIE). According to information provided during December 2009 from the Chief of the Livestock and Veterinary Department, the construction of 11 regional and 115 district veterinary laboratories and a network of slaughterhouses is planned for the republic by 2011, within the framework of implementation of the Law on Food Safety, with the purpose of achieving greater State

control over food safety implementation. From 1 January 2010, responsibility for disease prevention has shifted to a new sector in each *oblast*/district livestock department in Akimats. An additional 3 000 specialists will be employed.

OIE has defined standards on notification, trade aspects and surveillance of listed diseases. The aim of the Terrestrial Animal Health Code is to ensure the sanitary safety of international trade in terrestrial animals and their products, by detailing the health measures to be used by the veterinary services of importing and exporting countries. The measures are also meant to avoid the transfer of dangerous pathogenic or zoonotic agents without the imposition of unjustified trade restrictions.

Food safety legislation

According to a review undertaken by FAO (2006), human health protection issues are dealt with by the Law on Sanitary-Epidemiological Safety of Population, which deals with the protection of human health in general, particularly from food-borne risks, which come under the SPS Agreement. Furthermore, food products are subject to the Law on Food Quality and Safety.

Food and agricultural standards formulation: Enhanced market access for Kazakh exports requires that they meet internationally accepted standards. The Agricultural Competitiveness Project (ACP), supported by the World Bank, has achieved good recent progress in harmonizing various animal health and food safety standards with the SPS Agreement, the TBT Agreement and other WTO requirements. This project has developed seven new technical regulations, of which four are already approved by government resolutions:

- Technical Regulation Requirements for the Safety of Meat and Meat Products in Kazakhstan;
- Technical Regulation Requirements for the Safety of Milk and Dairy Products;
- Technical Regulation Requirements for the Safety of Eggs and Egg Products;

- Technical Regulation Requirements for the Safety of Fish and Fish Products;
- Technical Regulation Requirements for the Safety of Honey and Products of Beekeeping;
- Technical Regulation Requirements for Packaging, Marking, Labelling and their Correct Application;
- Technical Regulation Conformity to Assessment Procedures.

The list of harmonized standards includes:

(1) Meat and meat products. Rules of acceptance and testing methods;
(2) Meat and meat products. Packaging, labelling, transportation and storage;
(3) Meat and meat products. Rules of acceptance and testing methods;
(4) Meat and meat products. General technical requirements;
(5) Meat and meat products. Organoleptic;
(6) Dairy products. General technical conditions;
(7) Dairy products. Packaging, marking, transportation and storage;
(8) Dairy products. Organoleptic method of defining quality indicators;
(9) Dairy products. Rules for acceptance and methods of tests.

Animal health legislation

Issues of animal health are dealt with by the Veterinary Law of 2009, which lays the foundation for animal health protection in Kazakhstan and aims at ensuring veterinary and sanitary safety, safety of animal products and raw materials of animal origin, veterinary medications, fodder and feeding additives, and safeguarding the population against common animal and human diseases.

The conclusion of an FAO team (FAO, 2006) stated that the country's legislation "now incorporates many of the principles stipulated by WTO law, but needs further elaboration in order to create a comprehensive

framework ensuring implementation of all requirements to be applied upon accession. Legislation on technical standards appears to implement WTO requirements quite comprehensively."

A thorough, detailed study of slaughtering and further processing facilities throughout Kazakhstan by qualified technicians and food safety specialists is required to estimate procedural and technological need requirements for compliance to internationally acknowledged quality and safety standards, and the capacity of national producers and processors to comply to such a standard.

Recent Russian food safety resolutions relevant to poultry meats

Two highly significant and very recent examples of mechanisms to support domestic poultry production in the Russian Federation are detailed in the following. It is expected that both these strategies will have a highly significant effect on the reduction of chicken imports entering the Russian Federation from the United States of America. In fact, they could lead to a total ban on United States chicken imports.

Ban of chlorine from antimicrobial washes for poultry meat

As reported by the United States Department of Agriculture (USDA) Foreign Agricultural Service (FAS) (Maksimenko, 2008)[75], the Chief Medical Officer of the Russian Federation signed a resolution postponing the ban on the use of chlorine in antimicrobial washes until 1 January 2010. It has been common poultry industry practice in many countries, most notably the United States of America, to use chlorine in antimicrobial washes to kill surface food-borne pathogens such as *Salmonella* and *E. coli*. Effective from 1 January 2010, imports into the Russian Federation of poultry treated with chlorine from any country will be prohibited. The ban could completely rule out imports of United States poultry in 2010, estimated at approximately 500 000 tonnes.

75.- Maksimenko, M (2008): Russian Federation. Poultry and Products. Chlorine ban postponed until January 1, 2010. USDA Foreign Agricultural Service. GAIN Report (Global Agriculture Information Network). 12/29/2008, GAIN Report Number: RS8099.

Russian health officials have declared the method unsafe and outlawed the procedure since 2008. The European Union (EU) has long enforced a similar ban on products treated with the chlorine procedure. Apparently, about 90 percent of Russian companies have complied, switching their technology to treat birds with cold air and acid sprays instead of solutions containing chlorine.

This issue has become one of great significance at the time of commencement of the CU, as Kazakhstan and Belarus will now probably adopt this stance against all imported poultry meat, and this could significantly restrict the inflow of United States chicken products.

Ban of frozen poultry meat for further processing

Another report by USDA FAS (Hansen *et al.*, 2008)[76] describes how the Russian Federation's Chief Medical Officer has signed a resolution stating that: "With the exception of mechanically separated meat and collagen containing raw materials from poultry meat, the resolution prohibits the use of frozen poultry meat for manufacturing baby food, dietetic nutrition (invalid and protective diets), and specialized food products for pregnant and nursing women, effective 1 January 2010." It further prohibits the use of frozen poultry meat for manufacturing into any type of food product, effective 1 January 2011. The EU also introduced a ban, commencing on 1 January 2010, on the use of frozen and thawed chicken product for further sale.

According to Hansen *et al.* (2008), the Russian resolution was signed because of "current scientific data confirming that using frozen meat significantly harms human health." In late 2007, the Russian Federation approved a voluntary national standard for chicken meat, known as GOST 52702-2006, which went into effect on 1 January 2008. This voluntary standard recommends using only fresh/chilled poultry meat for further processing. Consequently, those facilities that use frozen poultry meat to process other products cannot state on the label that they are in accordance

76.- Hansen, E, Maksimenko, M, and Barmore, C. (2008): Russian Federation. Poultry and Products. Frozen Poultry for Further Processing to be Banned. USDA Foreign Agricultural Service. GAIN Report (Global Agriculture Information Network). 7/1/2008, GAIN Report Number: RS8049

with GOST. Most Russian consumers believe that only those foodstuffs developed in accordance with GOST standards meet appropriate safety and quality levels. Currently, all imported poultry meat is frozen, while the great majority of imports into the Russian Federation (600 000 tonnes in 2009) are from the United States of America (Kokkonen, 2010)[77]. This resolution is expected to decrease poultry imports by as much as 20 percent.

As is the chlorine ban, this issue is also of high importance for Kazakhstan, which will now probably adopt this stance against all frozen poultry meat as a CU member, and this could substantially restrict the inflow of all imported (frozen) poultry meat. The opportunity for developing a market for domestically produced fresh, chilled and/or cooked chicken products seems greater than ever.

77.- Kokkonen, D, (2010): Daily Media Monitoring for MHP. Company e-mail service, Monday 18 January 2010.