



Kyrgyz Republic

Livestock Sector Review: Embracing the New Challenges



CURRENCY AND EQUIVALENT UNITS

(as of November 1, 2005)

Currency Unit = KGS Som
US\$1 = 43.85 Som
1 KGS Som = US\$0.02

WEIGHTS AND MEASURES

Metric System

ACRONYMS AND ABBREVIATIONS

AADP	Agricultural Area Development Project
ADB	Asian Development Bank
AI	Artificial Insemination
AMF	Anhydrous milk fat
CABS	Central Asian Breeding Station
CATBP	Central Asia Transboundary Biodiversity Project
CIDA	Canadian International Development Agency
CPI	Consumer price index
DFID	Department for International Development
DWG	Daily weight gain
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct Investment
FSU	Former Soviet Union
GEF	Global Environment Facility
GM	Global Mechanism
GoK	Government of Kyrgyzstan
GTZ	Deutsche Gesellschaft fur Tachnische Zusammenbart
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
KAFC	Kyrgyz Agricultural Finance Corporation
KAMIS	Kyrgyz Agricultural Market Information Service
KFW	Kreditanstalt fuer Wiederaufbau
KRIPF	Kyrgyz Research Institute of Pastures and Forage
KSBA	Kyrgyz Sheep Breeders Association
MAWRPI	Ministry of Agriculture, Water Resources and Processing Industry
NSC	National Statistics Committee
NZAID	New Zealand International Aid and Development Agency
RAS	Rural Advisory Service
SADC	Swiss Agency for Development and Cooperation
SBDP	Sheep Breeding Development Project
SME	Small and Medium Enterprise
SVS	State Veterinary Service
SWAP	Sector Wide Approach
UHT	Ultra high temperature treated
UNCCD	United Nations Convention to Combat Desertification and Drought
UNDP	United Nations Development Program

USAID	United States Agency for International Aid
USD	United States Dollar
VAT	Value added tax
VIP	Village Investment Project
WB	World Bank
WTO	World Trade Organization

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EXECUTIVE SUMMARY

I. The challenges of livestock sector development

Continuing a long Kyrgyz tradition, the livestock sector is one of the strongest components of the rural economy. The sector contributes substantially to the national economy by providing high value food, income, employment and foreign exchange. There are also significant indirect benefits which include reduced risks to human health, more sustainable use of arable land and pastures, access to lucrative markets and the possibility to add value to livestock products. The processing and marketing of livestock products are also attractive to women.

Available evidence suggests that recent growth in the value of sector output was due mostly to a strong increase in producer prices and only a small increase in productivity - despite the ample scope for growth of the latter. Productivity levels are low - number of calves/lambs born per 100 cows/ewes, milk yields, wool output and animal growth rates fall well short of genetic potential of the current mix of animal breeds and international industry standards. Current levels of animal productivity are low – due to poor nutrition, the high incidence of diseases, heavy affliction with parasites, and poor animal and farm management. By correcting these nutritional, disease and management constraints the livestock sector output can be increased considerably:

- Milk production could increase by 70%
- Mutton production could increase by 50%
- Beef production could increase by over 50%

For maximum results, simultaneous improvements have to be made to all aspects of livestock production. In Kyrgyzstan, improvement of livestock productivity should be a combined result of improvements in animal health, nutritional status, the general care and marketing infrastructure. Better nourished and well kept animals are less susceptible to diseases. Animals in optimal health condition produce more - bringing in more income with which nutrition and housing/care can be improved further. More efficient markets will translate increased productivity into higher farm incomes.

The context for promoting improved productivity in the livestock sector is, however, quite complex – a massive number of clients (small-holder farmers) all requiring public services. Faced with this sectoral characteristic, and with scarce budgetary resources, the public sector needs to make substantial adjustments from its past practices to be able to provide effective and affordable core services. Hence, difficult choices must be made about what services and by which institutions need to be performed. In addition, serious thought needs to be given to devising and applying new approaches to public service delivery that are in tune with the principles of a market economy.

This report reviews the key issues that must be addressed to meet this challenge and the programs and policies needed to operationalize this response. The main issues that need to be tackled to achieve increases in animal productivity are disease control, animal nutrition (pasture management and winter feed), farmer know-how and marketing and agro-processing. Addressing these constraints, rather than increasing animal numbers or changing the genetic composition of the national herd, is the key to raising output from the livestock sector. Implemented successfully, these programs and policies will facilitate continued growth of the livestock sector and further the sector's contribution to economic growth and poverty reduction.

The magnitude of constraints is very large

Let us take for example a 100 cow herd.¹ If herd size is staying constant (i.e. no animal mortality), then the number of animals sold will equal those born and the sector output will depend on the number of calves born. An output level that is lower than the calving rate would indicate that farmers are building up their herds.

Base Herd	Calving %	Total animals	Animals sold	Output
100	100	200	100	50%
100	80	180	80	44%
100	50	150	50	33%
100	30	130	30	23%
100	20	120	20	17%

What are normal sector output rates? In countries with well developed farming systems, annual output growth would be in the range of 45- 50%. In Kyrgyzstan, the latest Livestock Census suggests that the calving rate is slightly above 50%.² Since the growth in the size of the national herd size has been very modest, one would therefore expect an annual output growth rate of about 33%. However, at estimated 14% the output growth indicated in farm surveys³ is less than half of this figure. Therefore it appears that in Kyrgyzstan the magnitude of conventional livestock sector constraints such as mortality rates, feed availability and suboptimal animal husbandry and farm management practices is very large. Thus, the expansion of both the sector output and animal herds will be slow, unless mortality rates are lower and general animal care is improved.

Stakeholder views identify the most pressing concerns

Nearly all stakeholders consulted during the preparation of this report regard poor animal health and the lack of an effective veterinary service as the most important problems limiting the further development of the livestock sector (see Table 1).⁴

Table 1: Stakeholder perception of priorities in the livestock sector

Priority	Rank*
Animal Health	4.4
Breeding	3.7
Advice and extension	3.7
Marketing	3.6
Pasture Management	3.6

*Ranked from 5 – “Serious problem” to 1 – “Not a problem”.

Source: Stakeholder survey.

Other key issues identified are, in order of rated importance, more effective breeding programs, improved advisory/extension services, better systems for marketing livestock and livestock

¹ There are very few of these in Kyrgyz Republic, but its a good number for simulation - herd size should not have an effect

² Cows make up 51% of the national herd while calves under 1 year make up about half of this at 57%

³ BASIS 1999, 2001 and 2003 farm surveys

⁴ See Chapter 4 for the description of the survey.

products, and improved pasture management. In each case more than 84 percent of the respondents consider these issues to be important constraints that need to be removed if the livestock economy is to move forward.

II. Animal health situation is not under control

Diseases and parasites are major problems, with significant negative impact on animal productivity and human health. The current veterinary services system, with its obsolete administrative procedures, hierarchic structure and flawed incentives, clearly can not guarantee the necessary control of animal diseases and zoonoses in the country. The rapid increase in the incidence of brucellosis in both animals and humans in Kyrgyzstan is symptomatic for all the problems and deficiencies in the current veterinary system. Brucellosis costs an estimated Som 15-20 million annually in human treatment costs with the Som 20-30 million in other losses to the national economy (loss of employment, government revenue, social security payments and etc.). To the sheep industry, Brucellosis-related losses are estimated at around Som 168 million annually (processing instead of carcass sale, abortions and etc.). These figures are only based on reported cases and the real costs are much higher.

There are sufficient numbers of qualified veterinarians to meet today's and tomorrow's needs and to ensure animal and human health. But it will require adopting a new approach to providing veterinary services. The **public sector** needs to focus – effectively – on regulation, monitoring, border and quality control, and ensuring Kyrgyz compliance with international standards and norms. The **private sector** must be given the necessary room and support to be able to provide quality service to the livestock owners; this includes, very essentially, a policy of facilitating the adequate availability of high-quality veterinary drugs and vaccines and, thus, an end to the current restrictive drug and vaccine procurement practices. From a quick survey and interviews with private veterinarians the picture emerges that contrary to what many officials think, many farmers are eventually willing and manage to pay for services.

Avian Influenza Project offers an entry point for addressing several concerns

All of the pressing animal health issues are centered on proper policy and strategy formulation by government services, the development of an efficient and effective public private veterinary services relationship, increased awareness of food safety and quality issues through the whole chain and with all stakeholders. The recently prepared Avian Influenza Control and Human Pandemic Preparedness and Response Project has been designed to address several of these issues. Its components, described below illustrate the importance of these concerns very well.

A major role in controlling livestock related diseases is awareness raising and simple management measures to be applied by the farmers themselves, such as extreme care at time of high risk of disease transmission and avoiding contact with infected animals. The veterinary department is traditionally not equipped for communication and awareness raising of large numbers of people. The project will finance the establishment of early warning systems to support emergency and feedback system for notifiable animal diseases as part of the development of participatory disease search techniques. A key objective will be to improve the commitment of all participants of epidemiological surveillance networks.

Reliable diagnostics data needed to assess the status of various livestock diseases are lacking. The root causes of the decrease in disease surveillance are shortage of funding for travel,

transport and reagents, the poor state of most laboratories, and low morale of the underpaid laboratory staff. None of the veterinary laboratories currently meet international standards. The Project will extend its support to strengthen the capacity of the Republican Central Veterinary Laboratory and some of the associated oblast laboratories and raion facilities in sample collection and submission, detection and follow-up of reported HPAI cases. Project support will also support an establishment of virology and serology testing procedures.

Particularly essential is collaboration and coordination among government agencies in the area of controlling zoonoses. The wide discrepancies between Ministry of Health (MOH) and the State Veterinary Department (SVD) statistics on brucellosis and other key diseases are indicative of the poor coordination of efforts. The project will support activities aimed at improving policy, legal and regulatory framework that governs the national capability to implement disease detection, control, prevention, containment and eradication measures in a uniform and effective way and in accordance with international standards and guidelines. Staff of the Ministry of Agriculture, Water Resources and Processing Industry (MAWRPI), SVD, MOH, the Ministry of Justice (MOJ) and other concerned agencies will draft the necessary legislative amendments (including to the Veterinary Law), regulations and implementation guidelines.

Nonetheless, a broader strategy is required

Veterinary service reform. Core tasks of a public veterinary service include policy formulation, disease monitoring, service supervision, and international reporting and liaison. For the SVD to perform these key tasks, a number of measures will need to be taken:

- Preparation of a detailed plan of structural reform and operational refocusing of the SVD and other public veterinary services such as the Veterinary Militia, as well as identification of assistance requirements to develop and implement such a plan;
- Development of a workable framework for public-private collaboration in veterinary service provision and public health monitoring, with effective contracting, monitoring, reporting and supervision arrangements;
- Development and implementation of a plan for the phased elimination of superfluous positions in the public services and the simultaneous privatization of veterinary positions and veterinary practices.

Promotion of private veterinary practice. Making private veterinary practice the foundation of the veterinary service system will require investments in facilities and equipment, improved drug and vaccine delivery mechanisms, improvements in knowledge and skills, and an effective professional organization of private veterinarians. Provided they satisfy certification requirements, they should also receive a contract from the SVD for carrying out clearly stipulated public-good veterinary tasks at village level. The private veterinarians need a more effective and truly independent professional association that has meaningful objectives and is an effective and attractive service provider for its members. It should, for instance, assist its members in upgrading their skills and capabilities. It should also play a role in ensuring the quality of veterinarians' work, by means of a professional self-policing mechanism. In addition to the elaboration of the above recommendations, the report offers the lists of other complementary actions.

Nationwide Brucellosis Control Program. The current brucellosis control strategy is hampered by vested interests and outdated knowledge: choosing brucellosis control with a new approach would show leadership, professionalism and would be the crucial opening move in changing the Kyrgyz veterinary services (both public and private) into a modern, efficient and effective system. The nationwide brucellosis control program would, besides objectives, inputs and activities and results also get a powerful immediate impact with tremendous social and monetary advantages for the country. With a decrease in the incidence of brucellosis in both animals and people the veterinary profession would regain some of its lost professional pride and respect and make a major contribution towards the development of Kyrgyzstan.

III. Improving animal nutrition and management of pastures

Poor nutritional status of the animals, especially during the winter

On average, and assuming equal distribution over all animals, the total feed (dry matter, DM) available annually in Kyrgyzstan per dairy cow is about 2.3 tons. By comparison, the average feed intake of a dairy cow in Ireland is 4.6-4.9 tons per year. This comparison indicates that the quantity of feed per animal in Kyrgyzstan is low. It also shows that feed supply is a far more pressing concern than increasing the national herd size and that current estimate of the country's carrying capacity for livestock may be unduly optimistic. Finally, it strongly suggests that the feed constraint on livestock productivity will increase in severity if the current trend of declining pasture productivity were to continue. The other conclusions are:

- The current animal numbers in the country appear reasonably close to the carrying capacity of the pastures. However, there is a serious imbalance in pasture utilization, with undergrazing of summer pastures and overgrazing of village/near-by pastures. This means, in effect, that the carrying capacity of the pastures used is being exceeded, and hence the decline in pasture productivity. In interviews conducted in five villages in different parts of the country, over three quarters of the 370 respondents stated that pasture conditions have deteriorated greatly during the recent past. More importantly for policy makers and livestock sector planning, these data also indicate that large increases in animal numbers are not possible without first reversing this trend.
- Winter nutrition is poor. Both quantity and quality of winter feed are poor, and animal diets are deficient in the major nutrients, energy and protein. Poor animal performance and high mortality rates are strongly associated with insufficient quality feed in winter and early spring. Many animals loose half their body weight through the winter. For example, if liveweight can be maintained over winter, cattle would weight at least 200 kg more and be worth an additional Som 6,000 at 30 months age.
- Farmer knowledge of husbandry and management techniques is deficient. All stakeholders in the livestock sector need additional training and information on animal husbandry, animal health, food safety and quality issues. Existing knowledge is partly outdated and an infusion of new ideas and concepts is needed.

More sustainable pasture utilization

This is a critical point. Under-grazing of summer pastures is leading to weed infestation in these pastures, and over-grazing of near/village pastures, with consequent reductions in animal

performance. The main concerns are: i) integration of summer pasture use with other pastures, and ii) short-term promotion of arrangements which allows smallholders to use summer pastures. In addition, the smallholders must be encouraged to continue to collaborate together so as to gain access to more remote grazing areas. Rotational grazing of all pasture types should be initiated and promoted.

The current institutional and policy framework reflects incomplete and ad hoc arrangements for dealing with changing circumstances and regulatory authority is diffused among various government units. Current pasture management practices retain many vestiges of Soviet-era regulations that are largely ignored. In fact, the current system operates parallel to, rather than in accordance with, the law. The division of pasture land among three tiers of administration fragments what should be an integrated process for assigning the use of what needs to be regarded as a single and indivisible natural resource. This fragmentation of administrative responsibility makes it very difficult to ensure sustainable use. The appropriate management approach is one that ensures an integrated use of all pastures and their seasonal use in accordance with vegetative growth and rest patterns. Such a management system can now be introduced because of the lower livestock numbers which allow rotational use and, thus, periodic resting of each pasture area.

Considerable experience has already been gained in Kyrgyzstan with pilot projects implemented under the Sheep Development Project and the Central Asian Transboundary Biodiversity Project, as also with the community empowerment model successfully developed under the Village Investment Project, particularly with regard to participatory investment planning and use of community assets. The results of properly designed and implemented pasture management pilot projects would then guide the formulation of national policy and relevant legislation and regulations as well as subsequent public awareness and capacity building campaigns.

Increased quantity and quality of winter fodder

The report estimates that feed available for winter per sheep equivalent is only about half of that available pre-independence. In addition, the quality of much of the hay is poor, being cut when it is too mature (resulting in low energy and protein contents), and often curing/storage is poor with resultant deterioration in quality. Loss of energy and nutrients from conserved feed during hay making and storage is estimated to be as high as 40%. This is leading to very poor animal performance during the winters. A program of fodder improvement should be undertaken with the aim of encouraging farmers to cut hay at a more suitable stage of growth and minimize losses in field, during storage and at feed-out.

Controlled breeding

In a pasture-based system, lambing should take place around the time that grass growth commences in spring, so that there is plentiful supply of grass to ensure that the ewe has an adequate milk supply for the lamb. As with sheep, cows should calve in the spring so that when the cow has the greatest demand for feed in early lactation, there is a good feed supply to match this. In countries like Ireland and New Zealand, most cows calve every year (if not, they are culled), and most cows calves around the time that grass growth commences. A new farmer extension program to improve sheep and dairy cow husbandry (see below) should be undertaken to address these issues. Such program should be provided together with support to privately provided service of artificial insemination.

Expansion of an effective advisory service

Increased productivity of the livestock systems is not intrinsic to the improved germplasm but is rather a function of availability of and access to improved inputs and knowledge. The skill and knowledge level of many farmers on issues of animal husbandry and nutrition, and pasture management needs to be improved. It would be a strong driver of change and improvement in the industry at this stage of its development. The Kyrgyz Republic is well positioned to take advantage of such initiatives. There are better records available and the Rural Advisory Service is now present in each raion providing a structure through which education and extension/development work can be routed. The Agricultural Training Centre set up under the same project (ASSP) has built up a unique experience in Kyrgyzstan in designing training programs and materials and with actual training. Their capacity to better respond to the needs of the livestock sector can be increased through the recruitment of a number of additional specialists with very specific task descriptions.

IV. Creating an enabling environment for a vibrant agro-processing sector

There is a strong unsatisfied demand for livestock products. Consumers are spending more on livestock commodities, mainly because of higher real prices, but physical consumption has not increased substantially due to supply-side constraints. For example, from 2000 to 2003, there has been a 12% increase in expenditure on mutton – but a 10% fall in physical consumption. Households were prepared to maintain the budget share allocated to mutton, and so increase expenditure, but higher prices meant that actual consumption levels fell. Increased production and more efficient markets are the best response to this supply side constraint.

Demand analyses suggest that growing demand has exceeded the capacity of producers to respond by increasing supply. Slow supply side response therefore appears to be a much more limiting constraint to livestock sector growth than demand side constraints. As a consequence the products of Kyrgyz livestock producers are in relatively high demand, and they therefore do not have to “chase the market”. However, the immediate challenge for the livestock sector will be to maintain its share of domestic markets in the face of increasing competition from imports.

Overall, it appears that while the institutional and physical market infrastructure may be rudimentary, market chains for livestock products, (with a notable exception of wool), operate fairly efficiently. No single participant appears to be making returns that are far in excess of his contribution or role in the overall marketing process. With the exception of wool, producers generally realize very attractive returns on their costs, typically in excess of those achieved by their counterparts in other transition economies. Meat prices for farmers are very similar to the prices received by farmers in New Zealand, for example. In contrast wool prices are about 25% of the expected international price.

However, high transaction costs (due to poor infrastructure, limited information, weak contract enforcement and corruption) continue to tax small farmers which have poor access to information and suffer from weakly developed assembly systems. The commercialization of livestock products has been facilitated largely by informal sector “middle-men” who take full advantage of the weak bargaining position of both small-holder producers and agro-processors. While this has allowed livestock markets to grow it has not removed the underlying constraints of poor access to information, weak assembly systems, inadequate contract enforcement and poorly developed links between producers and processors. Indeed, these middle-men thrive

precisely because of these deficiencies. Some attempts have been made to address these constraints through the formation of producer associations as the basis for improving product quality and strengthening marketing activity (e.g. sheep farmers associations). Further efforts to develop producer based marketing associations are essential, but they should be linked more closely to markets and agro-processors. In this regard, the Agribusiness Competitiveness Centre (ABCC), created under the Agribusiness and Marketing Project (ABMP), is now concentrating on the attraction of livestock product (hides, carcasses, milk powder etc) purchasers from neighboring (China, Kazakhstan) and more distant (UAE, Russia) markets.

The institutional environment and governance standards in agricultural product markets are poorly developed, and this gives rise to various problems:

- While there is legislation and regulations, their application is unpredictable and often used for rent-extraction: reimbursement of the VAT on exports, for instance, typically requires significant unofficial advance payments before a refund will be provided.
- Legislation and regulations are in place concerning the registration and taxation of businesses involved in foodstuff production – but the domestic market is dominated by products that are produced by unlicensed processors who do not pay taxes or necessarily adhere to health and safety requirements. Not only this is a major risk to public health, but it also greatly impedes the development of a formal and registered processing industry because it will not be able to compete with untaxed and unregulated operators.
- There is a general lack of forward contracting among processors and buyers, especially for sheep products; the main reason appears to be low confidence in the legal system and the enforceability of contracts.
- A problem faced by producers of goods that are both primary and consumable is the absence of independent quality certification or verification; with many livestock products at present in high demand, the problem is masked because buyer competition compensates for the lack of producers' bargaining power, but once supply increases this could develop into a serious problem.

Strengthening bargaining position of the small producers

In certain areas producers would benefit from the creation of producer marketing associations. However, it must be stressed that these should only be considered where there is a clear marketing nexus between producers and where there is demand for this intervention. Perhaps the best example is in the dairy sector, where producers (and processors) would clearly benefit from the creation of marketing associations based on chilled milk storage tanks. This would enable a large group of individual processors to establish stable off-take contracts with local processing plants and enable them to enter into a closer relationship with the supply chain itself. In order to capitalize on work undertaken by other donors (such as GTZ) in creating producer associations, the ABCC is now concentrating on giving already established associations a stronger marketing focus.

Another example is the wool sector, where exporters and processors face enormous problems with consolidating sufficient volumes for shipment or purchase. Producers in a given area could create a marketing association, which would enable them to consolidate parties of wool that they

could sell direct to processors, without having to wait for the intervention of inter-market traders. Being in possession of larger parties of wool would also improve their bargaining power and ability to increase their sale prices. If such associations existed they could also provide delivery platforms for wider business advisory services that are clearly required in the sector to increase producer efficiency and sustainability. It would be expected that such interventions would lead to increased local processing and the creation of SMEs in the agricultural sector. The report details these and other complementary recommendations and areas for potential investment support.

V. Role for the Government

Government institutions and policies dealing with the livestock economy have yet to respond adequately to the new environment of private smallholder ownership. Smallholder farmers today dominate Kyrgyz livestock production and have emerged as one of the most dynamic components of the agriculture sector. National policies and programs should focus on supporting and sustaining this growth, which is a major source of economic development and poverty reduction. The development and growth of the Kyrgyz livestock sector will be determined by forces of market demand and supply, and the essential support services and the national policy and regulatory environment need to be in place and effective to provide the necessary incentives and support.

To date, public policy has not always been consistent with the increasingly commercial orientation of producers. Indeed, it very frequently still creates false expectations of public support among the participants in livestock commodity supply chains. These expectations may concern hopes for public support or fears of distortive market interventions that prevent private agents from expanding their interest in the sector for fear of risking their investment. Unpredictability and inconsistency in policy pronouncements and program design are detrimental to the confidence of private economic actors. More clearly delineated -- and more realistic -- definitions of the public sector's roles and responsibilities are therefore critical to sustained development of the livestock economy. Similarly, the sector development strategy and plan must be internally consistent and in full harmony with overall agricultural and macro-economic policies.

As MAWRPI considers its future priorities in the livestock sector it needs to keep firmly in view the importance of making the most effective use of the limited resources available. This means limiting the range of activities and improving the cost-effectiveness of those that remain in the public domain. It also means recognizing that the clients today and in future are not a few large-scale operators, but large numbers of smallholders. Services and service delivery mechanisms need to be designed accordingly. To take two specific subjects: animal breeding is not a priority activity for Government -- promoting the development of efficient private artificial insemination services is; fodder production is not an appropriate task for Government – but promoting the growth of a private seed industry that can deliver quality fodder seed is. The assessment of the Kyrgyz livestock sector summarized in this report and in the concluding matrix of priority actions suggest that key areas requiring policy attention and effective program implementation are animal health, the management of grazing lands, extension and applied research (especially to improve animal husbandry), and food quality and consumer safety.

Chapter 1 Introduction

I. The Livestock Sector – A Key Component of the National Economy

Continuing a long Kyrgyz tradition, the livestock sector is one of the strongest components of the rural economy. Livestock accounted for 44 percent of both total agriculture sector output in 2004 and half of the sector's impressive growth from 1992-2004 (Table 2). Among private farmers, who have been the main engine of agriculture sector growth since Independence, livestock output has grown almost two times faster than crop output. The export of dairy products, animal hides and wool also demonstrates the subsector's ability to compete on international markets, and there is ample potential to increase the production and exports.

Table 2: Composition of Agriculture Sector Output and Growth 1992-2004

	Gross Output 2004 (mill. Som)	% of Total Output	Change in Output 1992-2004	% Contribution to Growth
Private Farms – Crops	21,449	37	3,516	37
Private Farms - Livestock	10,386	18	6,491	18
Household Plots – Crops	8,774	15	202	15
Household Plots – Livestock	12,456	25	139	25
Large Enterprises – Crops	2,663	5	17	4
Large Enterprises – Livestock	553	1	11	1
Total – Crops	32,886	56	160	56
Total – Livestock	25,396	44	161	44
Total – Aggregate	58,282	100	161	100

^a Data indicate orders of magnitude rather than actual growth, as they are based on changes in nominal values.

Source: Natstatcom, World Bank Estimates.

As more than 96% of cattle and sheep, 97% of horses and 85% of poultry are owned by small-scale farmers (household plots and private farmers), growth in livestock production has also made a significant contribution to the reduction of rural poverty. By increasing both incomes and wealth, livestock production has improved the welfare and reduced the vulnerability of all but the very poorest rural households. Even among rural households in the bottom income quintile, the value of livestock assets increased by approximately 50% from 1999 to 2002, and sales of crop and livestock products increased 4.5 times.

These aggregate success figures mask the impact of a deep-seated transformation of the agriculture sector, which is still far from complete. Livestock numbers fell dramatically from 1990 to 1996, and have remained fairly stable since, apart from a gradual recovery of cattle and poultry (see Figure 1). The growth observed is thus due mostly to a strong increase in producer prices and a small increase in productivity. There has been a massive change in the structure of livestock ownership and the nature of livestock production systems. Large enterprise production has all but ceased. Among smallholders, the earlier dominance of livestock production on

household plots has been overtaken by new, private farmers. But while these smallholder farmers have sharply increased production and sales, they have yet widely to adopt modern production techniques or to raise productivity significantly. Livestock marketing arrangement also remain rather rudimentary, despite the rapid growth of livestock product sales. And Government has yet to define clear roles for the public sector. The animal health system remains weak, product and food safety standards are inadequate, there still is too much emphasis on publicly funded breeding programs, and pasture management remains highly ineffective.

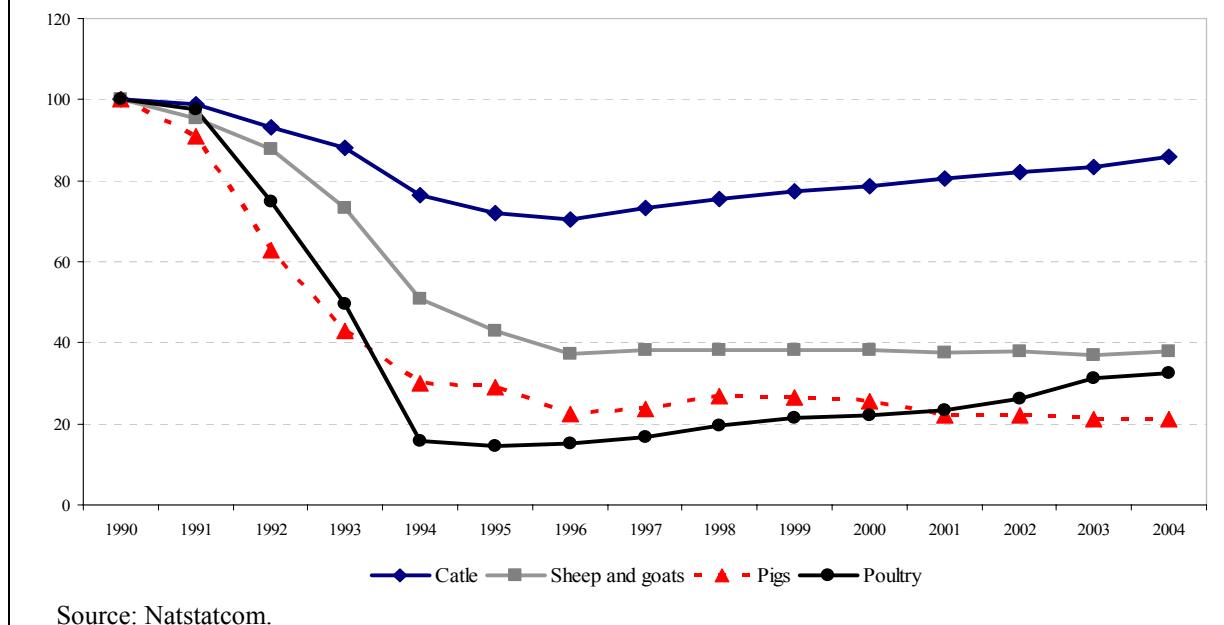
The challenge now is to complete the transformation of smallholder agriculture as the basis for sustained livestock sector growth. This report reviews the key issues that must be addressed to meet this challenge and the programs and policies needed to operationalize this response. Implemented successfully, these programs and policies will facilitate continued growth of the livestock sector and further the sector's contribution to economic growth and poverty reduction.

II. Legacies of the Soviet Era and Current Trends

The legacies of the Soviet era explain most of the changes that took place during the transition period. They also continue to influence current attempts to develop the agriculture sector and livestock production in particular. It is important, therefore, to understand from which initial situation this transition process started and the most relevant historical and background factors which influence current structures and practices. Furthermore, it is important to understand why customary solutions are no longer adequate for the present challenges.

Massive reduction in livestock numbers and change in ownership patterns. Following the dissolution of the collective and state farms and the distribution of their livestock to the former workers, livestock numbers declined rapidly from 1990-1996 (see Figure 1), as large numbers of animals were sold or slaughtered. This resulted in abnormal age structures of the national herd and grossly distorted succession ratios, slowing the subsequent expansion of the industry. This decline was especially pronounced for pigs, poultry and sheep, as the severe financial problems faced by large enterprises made it difficult for them to buy feed and replacement stock. Cattle and sheep have also assumed greater importance relative to poultry and pigs, consistent with the underlying pasture resource base for livestock production.

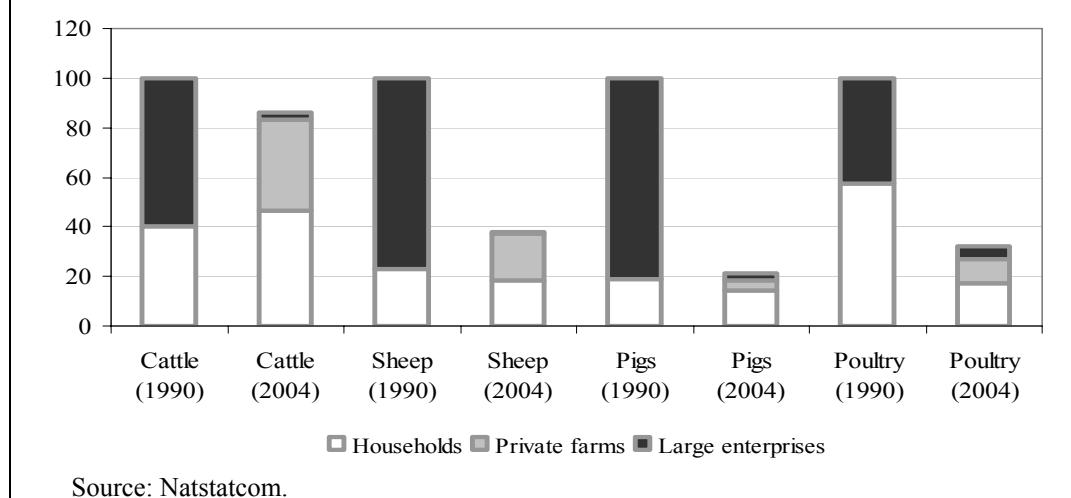
Figure 1: Trends in Livestock Numbers 1990-2004 (end year)



Source: Natstatcom.

The shift from public to private livestock ownership also dramatically changed the nature of production systems (see Figure 2). Smallholder production systems now predominate, and among smallholders, private farmers have steadily replaced household plots as the main source of output and sales. While household plots have continued their active involvement in livestock production, as before Independence, their limited access to land and capital has constrained their ability to expand output as far and as fast as private farmers. The private farming sector has driven the growth in livestock sector output, while livestock output in the household subsector has stagnated. In terms of the number of animals, the changes virtually offset each other, and the net effect has been only modestly positive: i.e., the decrease in animals held by household farms has been offset by the increased number of animals in the private farms subsector. Householders, however, remain important -- especially in dairy.

Figure 2: Change in the structure of livestock ownership



Source: Natstatcom.

Large skill gap. Only those collective and state farm workers who had been directly associated with livestock production had any of the technical skills required to initiate a successful livestock farming enterprise. An even among these, skills generally were limited to specific aspects of livestock husbandry, due to the high degree of specialization on the previous collective and state farms. Moreover, all entered the new era without the essential business and management skills required to operate an independent enterprise in a market economy. Lack of these skills and of capital also meant that most of the new private farming community was not well positioned to introduce new and improved technologies. The growth in livestock numbers since 1996 has therefore not been accompanied by significant improvements in livestock productivity. Pasture and fodder management, feeding practices, animal housing and animal health care are all deficient, largely subsistence oriented, and producers lack the information and skills needed to improve livestock management. In consequence, reproduction rates, milk production, and meat and wool output have improved very little and remain very low by international standards.

Poor pasture management. The basis for, and knowledge of, effective and sustainable pasture use that had characterized the pre-Soviet transhumant pattern of livestock and pasture management largely disappeared, as did the institutional arrangements that had governed the adaptation of these arrangements to the collective farming system. With their demise, present-day pasture-based animal raising in Kyrgyzstan has been pushed into an annual cycle of insufficient pasture production and overgrazing, which is unproductive, unsustainable and self-perpetuating. The pastures represent a large and highly valuable national resource, and much needs to be done to achieve their optimal use. The smallholder farmers who now own most of the animals tend to graze them on near-by pastures (close to villages) year-round, which results in overuse of these pastures and under-use of the summer pastures further away. Correcting this imbalance requires coordinated action on several fronts – including reform of the legal and regulatory framework governing pasture use, strong community involvement in pasture use arrangements and management, and appropriate contractual arrangements for livestock herding on public pastures.

Poverty. The entire economy, and in particular the rural population, was plunged into a poverty trap with no capital base or credit access to initiate private enterprise -- to replace animals, improve sables and barns, acquire or replace worn-out machinery, and maintain infrastructure. Dramatic decline and subsequent stagnation in household incomes, combined with rising food prices, led to major changes in the demand for and consumption of livestock products (see Table 3). Household incomes fell particularly sharply in rural areas where income levels are lowest. In consequence, consumption of meat and eggs fell by 70% from 1990 to 2003, and dairy product consumption declined by 63%. Since about 2000, aggregate consumption of livestock products has finally begun to recover due to economic growth and rising incomes, especially in urban areas.

Table 3: Trends in Livestock Product Consumption: 1990-2003

	1990	1995	2000	2003	% Change	
					1995-2003	2000-2003
Meat Products (kg/capita)	42.2	25.0	12.8	12.6	-50	-2
Urban	n.a.	26	15	16	-39	7
Rural	n.a.	24	12	12	-50	0
Dairy Products* (kg/capita)	241.2	171.2	87.4	88.6	-48	1
Urban	n.a.	87	62	75	-14	21
Rural	n.a.	204	101	96	-53	-5
Eggs (unit/capita)	159	67	51	49	-27	-3
Urban	n.a.	49	44	57	16	30
Rural	n.a.	75	54	60	-20	11

* Calculated in milk equivalents. ** Calculated for 1995-2002.

Source: Mission calculations, derived from Household Budget Surveys for 2000 and 2003.

Slow institutional and policy response. Government institutions and policies dealing with the livestock economy have been slow to respond to the new environment of private smallholder ownership and of the separation of public and private sector functions in a market economy. The current policies, programs and institutional arrangements generally fail to delineate and differentiate appropriately between public and private roles and responsibilities, and public service delivery has yet to adapt effectively to an environment characterized by many more private clients and much fewer livestock numbers. At the policy level, this is most obviously apparent in the continued focus of subsectoral development plans on quantitative output targets. Considerable emphasis is still placed on the preservation of Soviet-era institutions and programs (e.g., public breeding programs and breeding centers) which should be accorded very low priority relative to other needs (e.g., the promotion of effective private veterinary care), and state intervention remains widely considered as the solution to problems which the private sector can resolve.

III. Elements of an Effective Livestock Sector Development Program

Smallholder farmers today dominate Kyrgyz livestock production and have emerged as one of the most dynamic components of the agriculture sector. National policies and programs should focus on supporting and sustaining this growth. This report provides the outline of a multi-faceted support for livestock sector development. On the production side, a concerted effort is needed to introduce more efficient production systems, aided by effective and widespread dissemination of know-how and skills to farmers. Livestock markets will strengthen and the incentives to market livestock products will grow in response to support for market oriented producer associations and more effective links between producers and processors.

The public sector needs to focus on providing a conducive policy and regulatory environment. The potential impact of these measures extends beyond the sustainable growth of smallholder livestock production. Rural income levels will rise, not only due to the direct impact of increased production on smallholder wealth and income, but also due to the indirect effects of employment creation in marketing and processing. Rural households in extreme poverty are

likely to benefit most from these indirect employment effects. Increased processing and value-added will also broaden the base of the rural economy and enhance overall economic growth.

The key characteristics of the current and future demand for livestock products are presented in Chapter 2. Beyond the farm gate, demand for livestock products is strong, but markets are weak. The private institutions needed to reduce transaction costs -- by improving access to information, lowering assembly costs, raising and ensuring product quality, and strengthening bargaining positions -- have yet to develop fully. This is true for both producers and processors and results in very weak links between them. Chapter 3 provides an overview and analysis of the main livestock product supply chains. It identifies the key constraints and the most important opportunities for market development, and it suggests priorities for donor and government action.

On the supply side, current smallholder livestock production is constrained by low productivity and the limited adoption of more efficient, market oriented production systems. With no tradition of commercial and/or smallholder production and very limited access to outside information, inadequate knowledge of modern smallholder management techniques explains much of this deficiency. Essential support services, especially in animal health and breeding (i.e., artificial insemination), are poorly developed, lack sufficient coverage, and remain largely inappropriate to meet current needs and future requirements. Chapter 4 provides an assessment of the animal health care situation and suggests actions for improving veterinary services provision in a manner that is conducive to private sector development and responsive to the external commitments of the Kyrgyz Republic.

Chapter 5 addresses the critical issue of pasture use and management. It highlights the multiple problems arising from the present asymmetry between national policy objectives on the one hand and ineffective institutional arrangements and conflicting policies and regulations on the other. It summarizes current procedures governing pasture allocation, management and use, and assesses their effectiveness in the light of the substantial gaps between the existing regulatory requirements and actual practice, and it offers a set of recommendations to make pasture use both effective and sustainable by shifting primary responsibility to the rural communities and the actual pasture users.

Chapter 6 concludes the discussion of supply constraints. It covers critical aspects of current and potential productivity in the livestock sector and identifies priority areas to increase productivity. The key conclusion is that very substantial productivity and output gains are possible through effective improvements in animal nutrition and health, and that emphasis on increasing the national herd size and/or on upgrading genetics would be misplaced.

Chapter 7, finally, provides an overview of current and proposed governmental programs and a basic assessment of their relevancy and effectiveness, along with a summary of stakeholder views. It then identifies priorities for governmental and public sector action. The overarching theme is that governmental support institutions and services need to operate within a more clearly defined framework of their responsibilities and functions, appropriately geared to the requirements of a private and market-driven livestock sector and to the safeguarding of public health. External aid donors should continue to assist the Government in clarifying and redefining public and private roles and responsibilities.

Chapter 2

Demand for Livestock Products

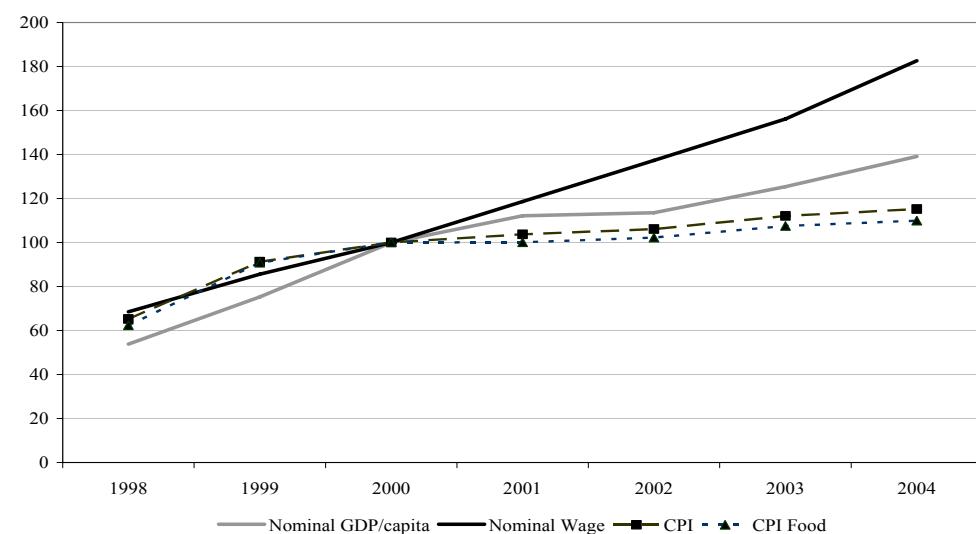
I. Introduction

Domestic demand is a key determinant of livestock sector output and growth in Kyrgyzstan. Livestock products are a traditional element of household food consumption, and most livestock production is consumed domestically. This Chapter presents the results of the analyses of the characteristics and determinants of domestic demand for livestock products, and considers its impact on livestock sector growth. The specific objectives of this Chapter are to: (i) identify the determinants of household consumption of livestock products, and derive relevant price and income elasticities, and (ii) assess the potential for future increases in the consumption of livestock products.

II. Characteristics and trends of household expenditure

Economic Trends 1998-2004. Kyrgyzstan experienced steady economic growth from 1999 to 2004 in response to economic reform, with a concomitant increase in real wages and incomes. Inflation remained high initially, from 1998 to 2000, but has been less than 5% annually since 2001. Food prices have followed the general trend in inflation, increasing by 60% from 1998 to 2000, but with only moderate increases thereafter. A comparison of trends in nominal wages and GDP/capita with trends in inflation shows that food prices grew faster than incomes before 2000, but incomes grew faster thereafter (see Figure 3). Food purchasing power thus increased in response to economic growth. Population growth was slow during this period (averaging less than 1% per year), and therefore was not a major source of growth in aggregate demand for food.

Figure 3: Indices of nominal GDP per capita, nominal wages and inflation (1998=100)



Source: Natstatcom

A significant change in income distribution also occurred, further boosting the demand for food. Economic growth resulted in a marked reduction in the percentage of households below the poverty line, from 55% in 1999 to 41% in 2003, and a commensurate change in the pattern of income distribution (see Table 4). These changes suggest that the benefits of growth have been

widely distributed and that many low income households have acquired additional resources with which to increase food consumption.

Table 4: Selected Indicators of Income, Poverty and Income Distribution

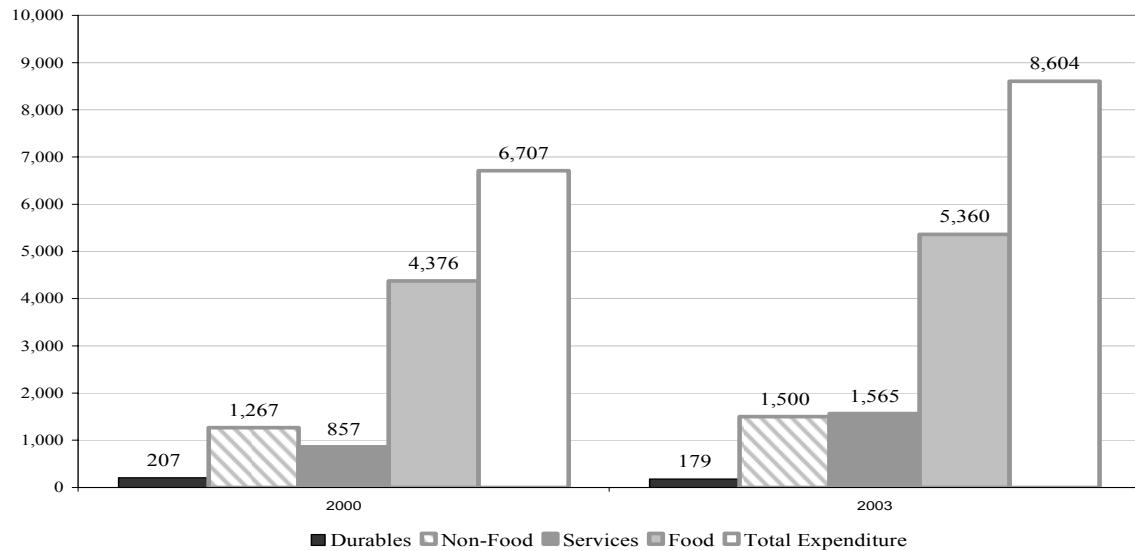
	1998	1999	2000	2001	2002	2003
GDP/capita (\$US)	341	257	278	309	324	378
% Below Poverty Line	na	55.3	52.0	47.6	44.4	40.8
Income Distribution		Percent of Households				
< 450 Som/capita/month	70.0	54.7	45.3	34.7	31.8	23.8
> 450 Som/capita/month	29.9	45.2	54.6	65.4	68.2	76.2

Sources: Natstatcom, IMF

Together, these trends imply that aggregate demand for food increased during this period due to rising real incomes and diminishing income inequality. The impact of these factors is illustrated in Figure 4, which shows a 28% increase in real household expenditure from 2000 to 2003, and a corresponding 22.5% increase in household food expenditure. Nevertheless, overall household expenditure and food consumption remain low, due to the very low average incomes (GDP/capita of \$378 in 2003).

Aggregate Consumption Patterns. Household expenditure follows expected patterns with respect to both expenditure aggregates and across income groups. On average, food expenditure accounts for over 60% of total expenditure, with spending on services and non-food items each accounting for 17%-18% of the total (see Figure 4). Expenditure on durables is less than 3%. This pattern prevails across all income groups (expenditure quintiles), although absolute expenditure on each aggregate increases, particularly for durables. These patterns are consistent with low household incomes.

Figure 4: Average Household Expenditure by Expenditure Aggregate (in 2000 real prices)



Source: Household Budget Survey

Rising incomes from 2000 to 2003 led to some important changes in expenditure patterns, particularly among the poorest households. In the bottom quintile, food budget shares fell, while expenditure on services increased. In absolute terms, poorer households allocated most of their additional income to services and non-food items, with a very modest increase in food expenditure. A substantial increase in the relative cost of services over this period certainly contributed to this change in expenditure patterns, but it is also indicative of the limited access which poor households have to health and education services, particularly the former. Wealthier households also allocated a high proportion of their increased incomes to additional expenditure on services, with increased food expenditure being the second most important use of additional income. These shifts in expenditure patterns indicate that poor households face extremely difficult trade-offs between expenditure on food and essential services; while wealthier households are able to increase expenditure on both.

III. Livestock product consumption and expenditure

The 28% increase in real household incomes from 2000 to 2003 was associated with a 27% increase in real food expenditures. Average expenditure on cereal products increased by only 6%, compared with a 19% increase in spending on livestock products. However, the much greater increase in real prices for livestock products during this period limited the capacity of lower-income households to increase their consumption of livestock products.

Analysis of both expenditure and consumption shows that demand for livestock products increases strongly in response to rising incomes – both across income groups and over time. But due to significant increases in real prices of livestock products,

Table 5: Level and Composition of Livestock Food Basket: 2000 and 2003

	2000	2003	% Change
Real Household Expenditure (som/capita)			
Beef	285	428	51
Raw Milk	213	192	-10
Mutton	144	160	12
Processed Meat***	127	127	-1
Eggs	114	117	3
Other Dairy Products*	72	306	328
Pork	69	51	-26
Poultry	67	107	61
Other Meat**	31	25	-20
Total	1,120	1,513	35
Expenditure Share (%)			
Beef	25	28	11
Raw Milk	19	13	-33
Mutton	13	11	-17
Processed Meat***	11	8	-26
Eggs	10	8	-25
Other Dairy Products*	6	20	216
Pork	6	3	-44
Poultry	6	7	20
Other Meat**	3	2	-41
<i>Memo:</i>			
<i>Meat Expenditure Share (%)</i>	64	59	-8
<i>Dairy Expenditure Share (%)</i>	25	33	30
<i>Unprocessed Food Expenditure Share (%)</i>	82	71	-13
<i>Processed Food Expenditure Share (%)</i>	18	29	61
Volume Consumed (kg/capita)			
Raw Milk	41.2	33.3	-19
Other Dairy Products*	21.2	14.8	-30
Beef	5.1	5.8	14
Processed Meat***	2.4	2	-17
Mutton	2.1	1.9	-10
Poultry	1.1	1.6	45
Pork	1	0.7	-30
Other Meat**	0.7	0.4	-43
Eggs (units)	49.7	49.4	-1
<i>Memo:</i>			
<i>Total Meat Consumption (kg/capita)</i>	12.4	12.4	0

Cheese, yoghurt, kefir, cream, sour cream, butter, bryanza, concentrated and dried milk, ice cream, etc.; ** Goat, horse, rabbit, wild animals, etc.; *** Sausages, animal by-products, canned meat, etc.

Source: Mission calculations, derived from Household Budget Surveys for 2000 and 2003.

this increase in demand has also resulted in a shift in the composition of livestock consumption – particularly among lower-income households. Demand for lower-priced products such as beef and poultry has increased more than for higher-priced products such as mutton and high-fat cheese, and dairy product consumption has shifted from raw milk to processed products.

The nature of this response also differs by location, due to differences in income levels and consumption habits. Growth in demand for livestock products is currently strongest in urban areas and in the north. There is also considerable potential for increased demand for livestock products in the south, provided that incomes continue to grow. Increased incomes are associated with increased demand for livestock products among rural households, but the impact is less pronounced than in urban areas, as rural households appear to give higher priority to increased expenditure on services.

These changes in consumption are reflected in Table 5 which shows the composition of the average livestock food basket in 2000 and 2003 (by value and volume). These data suggest the following:

- Meat products dominate household expenditure on livestock products (60%-65), although expenditure on dairy products is increasing;
- Households allocate most of their spending to unprocessed livestock commodities (70%-80%), but expenditure on processed commodities is increasing;
- The rise in expenditure on livestock products from 2000 to 2003 is largely a result of increased prices. Physical consumption of most livestock products fell, except for beef and poultry;
- Increased consumer prices and an associated change in relative prices have led to the following shifts in expenditure composition:
 - Reduced expenditure on meat products and increased expenditure on dairy products;
 - Reduced expenditure on raw milk and increased expenditure on processed dairy products;
 - Reduced expenditure on mutton and pork and increased expenditure on beef and poultry, although the physical volume of (total) meat consumption remained the same.

This combination of rising incomes, increasing expenditures, rising prices and declining (physical) consumption indicates that households are willing to spend more on livestock products, but that their capacity to do so is heavily constrained by low overall incomes and the need to obtain other essential goods and services. It also suggests that growing demand has exceeded the capacity of producers to respond by increasing supply. Faster growth in production and an associated moderation of livestock product price increases are needed to achieve more sustainable increases in livestock product consumption. There also appears to be growing demand for processed commodities. A strong supply response to both these influences would serve the interest of both consumers and producers.

More detailed commodity specific analysis is presented in the following sections to deepen understanding of the characteristics of demand for specific livestock products⁵.

⁵ Pork, other meat, processed meat and processed dairy products are omitted from this analysis -- pork due to its limited importance, the other commodities due to lack of sufficiently disaggregated data.

A. Raw Milk

Raw milk is a major component of the Kyrgyz diet, with over 90% of households reporting consumption in 2000 and 2003. Consumption levels are strongly correlated with household income, with an expenditure elasticity of 0.86. By contrast, an estimated own price elasticity of -0.48 indicates that prices have a lesser impact on demand. Given that own production provides more than 70% of consumption, the ability to purchase a cow may be a more important determinant of household consumption levels than the price of milk.

Location is also an important determinant of the level and pattern of consumption. Rural households and northern households have the highest levels of consumption and correspondingly higher levels of expenditure. Better access to (home produced) raw milk explains the difference between rural and urban households, and a stronger tradition of livestock product consumption explains the higher consumption in northern versus southern households.

Location had a quite different impact on the response of raw milk consumption to rising incomes, rising prices and increased substitution of processed dairy products for raw milk from 2000 to 2003. Among rural and northern households, raw milk consumption and expenditure decreased from 2000 to 2003, while it increased among urban and southern households. A noticeable increase in the proportion of raw milk purchased in the market, from 2000 to 2003, indicates that markets are responding to improved demand, although marketed supply exceeds own production only in urban areas. These trends suggest that there is significant unsatisfied demand for raw milk, especially in urban and southern areas, and much potential to expand domestic markets.

Table 6: Analysis of Raw Milk Expenditure and Consumption: 2000 and 2003

	Bottom quintile	Top quintile	Average	% Own Production
Expenditure 2000 (soms/capita, 2000=100)				
All Households	78.9	401.7	213.0	na
Urban	63.9	211.0	149.2	na
Rural	82.6	656.3	246.9	na
North	127.4	464.6	330.0	na
South	53.9	164.8	98.8	na
Expenditure 2003 (soms/capita, 2000=100)				
All Households	79.5	352.5	192.0	na
Urban	78.3	286.3	185.0	na
Rural	79.7	430.7	195.7	na
North	98.5	367.1	252.8	na
South	71.8	307.5	135.4	na
Volume Consumed 2000 (kg/capita)				
All Households	17.6	71.7	41.2	71.6%
Urban	12.1	29.6	22.2	9.0%
Rural	18.9	128.1	51.3	86.0%
North	30.5	82.0	61.9	69.8%
South	10.8	33.1	21.0	76.7%
Volume Consumed 2003 (kg/capita)				
All Households	16.0	53.8	33.3	55.6%
Urban	11.2	35.6	24.7	13.4%
Rural	16.9	75.4	37.9	70.2%
North	17.1	52.7	39.3	49.1%
South	15.6	57.5	27.7	63.9%

Source: Analysis of National Household Expenditure Surveys (Natstatcom)

B. Beef

Beef is consumed by the majority of households, and its consumption accounts for the largest share of household expenditure on livestock products (28% in 2003). Beef consumption is far more sensitive to price and income changes than raw milk, with an expenditure elasticity of 0.78 and an own-price elasticity of -0.73. Beef consumption also differs markedly from raw milk consumption in that more than 95% of beef consumed is acquired through exchange transactions. The combination of rising food prices and rising incomes from 2000 to 2003 led to a significant increase in household expenditure on beef, but a much lesser increase in physical consumption (Table 7). Indeed, the lowest income quintile reduced its physical consumption during this period, and this accounts for the lower proportion of households consuming beef in 2003, 81% versus 91% in 2000. These changes over time had no observable impact on the proportion of beef acquired through exchange transactions.

Table 7: Analysis of Beef Expenditure and Consumption: 2000 and 2003

	Bottom quintile	Top quintile	Average	% Own Production
Expenditure 2000 (soms/capita, 2000=100)				
All Households	139.3	461.6	284.6	na
Urban	159.4	597.5	397.0	na
Rural	134.5	280.2	224.8	na
North	115.9	418.7	291.5	na
South	151.4	623.4	277.9	na
Expenditure 2003 (soms/capita, 2000=100)				
All Households	183.0	776.3	428.4	na
Urban	214.8	911.7	591.9	na
Rural	176.7	616.2	340.5	na
North	115.6	768.8	465.5	na
South	210.2	799.5	393.9	na
Volume Consumed 2000 (kg/capita)				
All Households	2.7	7.6	5.1	3.9%
Urban	2.9	9.6	6.6	0.0%
Rural	2.7	5.0	4.2	7.1%
North	2.0	6.5	4.7	2.1%
South	3.1	11.9	5.4	5.6%
Volume Consumed 2003 (kg/capita)				
All Households	2.4	10.2	5.8	3.4%
Urban	2.7	11.7	7.8	0.0%
Rural	2.3	8.4	4.8	6.3%
North	1.4	9.8	6.0	5.0%
South	2.7	11.3	5.7	1.8%

Source: National Household Expenditure Surveys (Natstatcom)

C. Mutton

Mutton is one of the most expensive products in the Kyrgyz livestock product food basket and has also experienced one of the highest price increases since 2000. Average consumption is, thus, low at approximately 2.0 kg/capita/year, and only 33% of households reported consuming mutton in 2003, compared with 58% in 2000. Consumption is highly responsive to income, with an expenditure elasticity of 1.39, as compared with a much lower own-price elasticity of -0.63. These parameters are consistent with the household response to higher incomes and higher prices from 2000 to 2003, which resulted in a 12% increase in expenditure on mutton – but a 10% fall in physical consumption.

Households were prepared to maintain the budget share allocated to mutton, and so increase expenditure, but higher prices meant that actual consumption levels fell. Levels of consumption are similar in urban and rural areas, but there is a striking difference between north and south. The higher incidence of sheep production in northern regions improves access to mutton at both household level and in local markets – and allows higher consumption. This applies even to poorer households in areas such as Naryn, which explains the higher levels of mutton consumption among northern households across all income groups. Sheep production is less widely practiced in the south, and this factor plus low incomes results in quite low levels of mutton consumption. Markets are generally a more important source of supply than own production, except in the north. Market transactions have also increased in importance since 2000, especially in the south. These characteristics suggest once again that there is significant unsatisfied demand for livestock products in the south, despite lower household incomes.

D. Poultry

Poultry is a small but rapidly increasing component of the livestock food basket, although the full extent of changing consumption patterns is not apparent for the period of analysis. It was the most expensive meat commodity in 2000 and was still quite expensive in 2003 – despite a decline in real prices. The marked increase in average household expenditure and consumption from 2000 to 2003 was therefore driven largely by higher-income groups; while the share of households consuming poultry actually fell from 41% in 2000 to 29% in 2003. These trends are consistent with a high estimated own-price elasticity of -1.62 and an expenditure elasticity of 1.10. The heavy reliance on own production is largely explained by the collapse of the commercial poultry industry after Independence. Location is a lesser influence on consumption, except in the north where higher incomes lead to higher consumption.

Consumption levels and patterns have undoubtedly changed since 2003, in response to high volumes of cheap imported poultry meat. Poultry consumption has probably increased further, across all income groups, consistent with its high own-price elasticity. Urban consumers and lower income groups are the major beneficiaries of these changes.

Table 8: Analysis of Mutton Expenditure and Consumption: 2000 and 2003

	Bottom quintile	Top quintile	Average	% From Own Production
Expenditure 2000 (soms/capita, 2000=100)				
All	43.6	282.3	143.5	na
Urban	38.8	237.8	149.8	na
Rural	44.8	341.9	140.2	na
North	76.6	271.1	201.9	na
South	26.6	324.7	86.5	na
Expenditure 2003 (soms/capita, 2000=100)				
All	43.2	335.4	160.4	na
Urban	23.3	266.1	145.1	na
Rural	47.1	417.4	168.6	na
North	80.9	348.2	249.2	na
South	28.0	293.6	77.6	na
Volume Consumed 2000 (kg/capita)				
All	0.7	4.0	2.1	42.9%
Urban	0.6	3.2	2.1	4.8%
Rural	0.7	5.1	2.1	61.9%
North	1.2	3.7	2.9	37.9%
South	0.5	5.1	1.4	42.9%
Volume Consumed 2003 (kg/capita)				
All	0.5	3.8	1.9	26.3%
Urban	0.3	2.9	1.6	6.3%
Rural	0.5	4.8	2.0	40.0%
North	0.9	4.0	2.9	34.5%
South	0.3	3.3	0.9	11.1%

Source: Analysis of National Household Expenditure Surveys (Natstatcom)

E. Eggs

Approximately 80% of all households consume eggs, although average per capita consumption is low at 49 eggs/capita/year. Average consumption changed little from 2000 to 2003, despite a fall in real prices and a high estimated own-price elasticity of -2.00. Consumption patterns vary markedly between north and south. Northern households have the highest overall levels of consumption and southern households the lowest, but consumption and expenditure fell in the north from 2000 to 2003, while they rose in the south. Own production was the major source of supply, except for urban areas, but market transactions became more important from 2000 to 2003.

IV. Current and future demand for livestock products

A. Analysis of Current Demand

Regression analysis was used to examine the impact of household demographic factors on demand and to estimate price and expenditure elasticities. As livestock commodities are not consumed by all households, probit analysis was used to examine factors which condition the decision whether or not to acquire (consume) livestock products, and conventional ordinary-least-squares (OLS) analysis was used to examine the determinants of how much to acquire.⁶ This component of the analysis was limited to raw milk, beef, mutton, poultry and eggs -- first because these are the most important livestock commodities (accounting for two thirds of household livestock product expenditure), and second because data were considered more reliable.

Household expenditure (income) levels had a strong positive impact on both the decision to consume and the level of consumption – consistent with the preceding analysis. Larger households are more likely to consume milk and to consume more of it; while household size has a negative impact on poultry consumption. The impact of young children followed a similar pattern, exerting a strong positive impact on both the decision to consume both beef and mutton and on the amount consumed, and an equivalent but negative impact on poultry consumption. These results may reflect the perception of raw milk and beef as staples in the household diet, versus the perception of poultry as a more expensive product for wealthier households. Such attitudes are likely to change as incomes rise and poultry meat becomes cheaper and more accessible.

Urban location exerted a consistently strong negative impact, for almost all commodities, on both the decision to consume and the level of consumption. The exception was beef where it had no impact on the level of consumption. As urban households are wealthier on average than rural households, this negative impact may reflect inadequate access to livestock commodities and higher prices rather than lower demand. If this is so, increased production and more efficient markets are the best response to this supply side constraint.

⁶ The underlying models estimated in each case were conventional models of demand, but the estimates of price elasticity were adjusted to correct for the use of unit values rather than market prices in the raw data. Where household data are collected on the volume and value of food purchases, the resultant unit value reflects both price and quality influences – and the actual price is unobserved. The two-stage methodology was used to correct for this quality influence and allow the derivation of true price elasticities.

Table 9: Estimates of Elasticities for Selected Kyrgyz Livestock Products 2003

	Milk	Beef	Mutton	Poultry	Eggs
Expenditure Elasticities	0.86	0.78	1.39	1.10	1.02
Quality Elasticities	0.39	0.36	0.63	0.57	0.20
Price Elasticities					
Milk	-0.48	0.12	-0.052	0.38	-0.64
Beef	-0.57	-0.73	0.52	-0.07	1.50
Mutton	0.20	0.08	-0.63	0.22	0.22
Poultry	-0.15	0.01	0.54	-1.62	0.63
Eggs	0.18	0.17	0.20	0.02	-2.01

Source: Own calculations from Natstatcom Integrated Household Budget Survey

The elasticities generated from the OLS estimates, after correcting for unobserved prices, are presented in Table 9. They are generally high, which is usual for livestock commodities, and largely consistent with observed consumption patterns. Most of the cross-price elasticities are positive, indicating substitution between livestock commodities in response to price changes – as would be expected. Substitution effects were lower for milk and beef and higher for the more expensive commodities such as mutton, poultry and eggs. The positive quality elasticities indicate that consumers are prepared to pay a premium for higher quality products, a result which producers should take note of.

V. Simulation of Future Demand

A set of simple models was used to simulate trends in demand for the period 2005-2010 for beef, milk, mutton, poultry and eggs. These models were based on the following assumptions:

- An estimate of average per capita consumption for each product for 2005;
- An estimate of average consumer prices for each product for 2005;
- Elasticities of price and expenditure, and budget shares, as estimated in the preceding section (no attempt was made to examine the impact of substitution between products);
- An estimated GDP/capita of 20,000 Som for 2005, imputed from currently available macro-economic data; and
- A population of 5.1 million in 2005, and an annual population increase of 1% for the period 2005-2010.

The simulated scenario for each product included the combined impact of: (i) an increase in income (GDP/capita), based on current IMF projections, estimated at 5% per annum from 2005 to 2008 and at 3.5% per annum from 2009 to –2010, together with (ii) an increase in livestock product prices. The annual price increase was set at 10%, based on recent trends and the assumption that demand will continue to exceed supply due to weak supply response. The increase in prices was converted to an equivalent reduction in household incomes, and GDP/capita was adjusted downwards accordingly.⁷ The net impact on demand was then calculated as an income response, on the assumption that the impact of price changes is relatively small due to the very low budget shares of livestock products.

⁷ Calculated as the budget share multiplied by the percent change in price, for each year.

Table 10: Summary of Simulated Income and Price Changes on Demand

	2005	2010	% Change
Beef			
Kilogram/capita	6.0	7.0	17.0%
Total Consumption (tons)	30,600	37,625	23.0%
Milk			
Kilogram/capita	35.0	41.6	18.8%
Total Consumption (tons)	178,500	222,883	24.9%
Mutton			
Kilogram/capita	2.0	2.6	31.7%
Total Consumption (tons)	10,200	14,121	38.4%
Poultry			
Kilogram/capita	1.6	2.0	24.6%
Total Consumption (tons)	8,160	10,685	30.9%
Eggs			
Kilogram/capita	50	61	22.7%
Total Consumption ('000 units)	255,000	328,725	28.9%

Source: Own calculations from Natstatcom Integrated Household Budget Survey

The results are summarized in Table 10 which demonstrates the extent to which income effects dominate price effects. Consumption increases strongly for all livestock products, from 2005 to 2010, ranging from a 17% increase in beef consumption to a 32% increase in mutton consumption.

These results suggest that there is strong potential for a sustained increase in the demand for livestock products, provided that the economy continues to grow and household incomes continue to increase. More moderate price increases, in response to a stronger supply response, would further increase demand and consumption. All households would benefit from these trends, both producers and consumers. Note, however, that even with this rate of growth in demand, consumption levels in 2010 would still be markedly less than in 1995 and even lower than in 1990; except for poultry. Hence, there is considerable scope to increase consumption beyond the levels derived in these simulations.

Slow supply side response therefore appears to be a much more limiting constraint to livestock sector growth than demand side constraints. Note also that this potential for livestock sector growth is driven by domestic demand rather than by exports. Indeed, the immediate challenge for the livestock sector will be to maintain its share of domestic markets in the face of increasing competition from imports.

Provided incomes continue to grow, domestic demand for livestock products should remain strong. Policy makers can help to sustain this demand by ensuring that livestock products continue to trade freely, particularly between north and south. Support for processing should also be enhanced, in the form of credit and technical assistance for upgrading plant, improving product quality and more effective marketing. These and other measures are detailed in Chapter 3.

However the highest priority for policy makers is to reduce the supply-side constraints to livestock production, through measures to reduce losses and raise productivity. A more effective veterinary system is critical in this regard (see Chapter 4). On-farm productivity can be

improved by strengthening the public and private institutions which control the use of communal grazing land (see Chapter 5) and improved animal nutrition and farm management practices (see Chapter 6).

Chapter 3

Marketing and Processing

I. Introduction

Although driven mainly by domestic demand, the Kyrgyz livestock sector is the only net exporter of livestock products in Central Asia, and this adds an important international trade dimension to the agenda of Kyrgyz policy makers. Most of Kyrgyzstan's international trade in livestock products is unregistered, does not involve customs declarations, and does not appear in official statistics. Nevertheless, these exports are an important part of overall demand for Kyrgyz livestock products. Exports of live animals, skins, hides, wool and milk are considerable, and there is ample potential to increase these exports. Demand for meat is rising in neighboring countries, and non-traditional buyers are increasingly sourcing mutton from Central Asia. Dairy processors in southern Kazakhstan are also increasingly sourcing their milk in Kyrgyzstan. Exports of wool and hides are rising, and there is evidence of increasing foreign direct investment (FDI) in both subsectors.

The current pattern of livestock exports is very different from Soviet times. Live animals have replaced shipments of frozen carcasses and tinned meat. Exports of mutton are no longer linked to wool production. Dairy processing used to be concentrated in a small number of large facilities predominantly serving the domestic market, but despite their breakdown aggregate national milk production now exceeds pre-Independence levels. These changes reflect an extensive transformation of the domestic production and marketing systems since Independence.

Table 11: Number of livestock farmers and average herd sizes in 2003

	Number of farms with livestock	Average herd size per farm	% with less than 10 animals
Cattle	374,384	2.8	98
Sheep	208,798	13.2	57
Horses	151,830	2.2	98

Source: Natstatcom, 2003 Livestock Census

The majority of livestock farmers in Kyrgyzstan today are small (see Table 11). They prefer to act individually, selling to a trader for a discounted price if it means a quick sale. Marketing is rarely based on a planned strategy for disposing of surplus products. Instead, animals are sold when cash is needed – to cover school fees, social obligations, food purchases, or health care needs. Smaller farmers are more likely to sell at a discount, having less time and money to spend on marketing and market access, less capacity to bargain with traders, and less access to market information. However, because of their ability to vary production levels and consume the products in the household, and because of a wide choice of marketing channels, there is a certain resilience built into these systems. The challenge now is to enable these systems to become the basis for sustained supply of low-cost, high-quality and safe livestock products.

II. Supply characteristics

Householders and the majority of private farmers generally consume around 40% of their milk production and sell the remaining 60% in either raw or processed form. These proportions are similar for meat production. Sales of young animals are limited because, in the face of greatly limited access to credit, smallholders rely on breeding their own replacement stock. Hides, skins

and wool are sold more readily, because there is an active market for these products and because processing skills and capacities of the farmers are limited. Table 12 presents the disposal patterns of livestock products, based on the results of a recent farm survey.

Table 12: Disposition of livestock products produced by private farmers in 2003

	Cattle				Sheep				Horses			
	Milk	Meat	Hides	Calves	Wool	Meat	Skins	Lambs	Milk	Meat	Hides	Foals
Consumed	33%	35%	3%	89%	33%	62%	12%	88%	43%	49%	5%	91%
Sold	53%	65%	97%	11%	67%	38%	88%	12%	38%	51%	95%	9%
Processed	14%	0%	0%	0%	0%	0%	0%	0%	18%	0%	0%	0%

Source: Basis Farm Survey, 2003.

About half of all products marketed are sold through inter-market-traders, and a somewhat lesser quantity is sold directly to final consumers (see Table 13). There are few direct sales to processors, and almost nothing is marketed through marketing associations or cooperatives because these are only emerging.

Table 13: Marketing outlets used by private farmers in 2003

	Cattle						Sheep				
	Milk	Meat	Hides	Calves	Adult animals	Wool	Meat	Skins	Lamb	Adult animals	
Traders	53%	36%	48%	47%	42%	62%	46%	63%	41%	0%	
Consumers	31%	55%	35%	20%	30%	30%	52%	28%	54%	55%	
Processors	11%	0%	11%	0%	1%	6%	1%	5%	6%	45%	
Other	6%	8%	6%	32%	27%	2%	0%	3%	0%	0%	

Source: Basis Farm Survey, 2003.

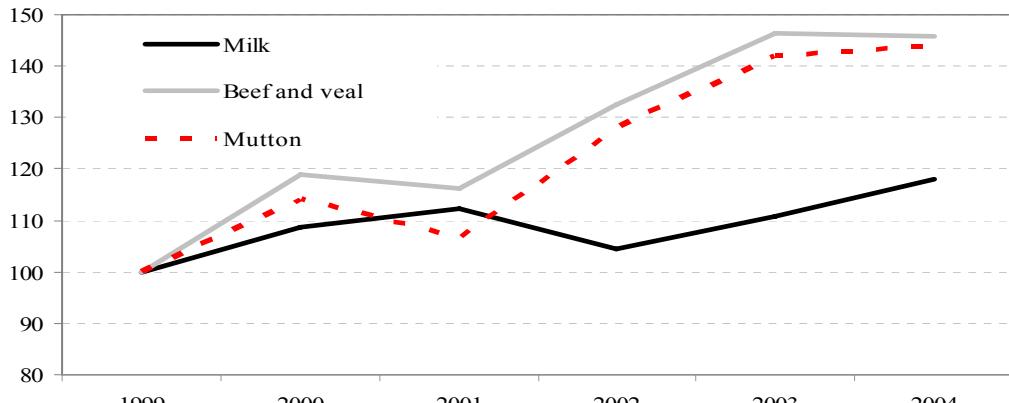
There is substantial seasonality in the sales of livestock products. Most milk sales take place during summer; in winter, with lactation rates low, the majority of households consume all of their own milk. In contrast, sales of meat and associated by-products usually take place during late autumn. Many producers slaughter their animals after fattening them on summer pastures and before the onset of winter when feeding costs are high and there is notable weight loss.

III. Recent price trends

Livestock product prices have risen more than average consumer prices during the 1999-2004 period. It is worth noting that there was increased activity of Kazakh buyers in the Kyrgyz market. Kazakh farmers had access to heavily subsidized government loans to stimulate livestock production, and many loan recipients utilized these funds to buy animals from Kyrgyzstan. This caused a 23% nominal price rise for beef and mutton in Kyrgyzstan in 2003. Kyrgyz livestock producers interviewed for the present study expressed satisfaction with the prices they were receiving and considered them a stimulus to increase their animal holdings.

The increasing price for milk is a very positive sign -- and not seen in many other transition economies where the price of raw milk has generally stagnated. Part of the reason for the strong price of milk is the gradually increasing demand from domestic processors, but also contributing is demand from dairy plants in Kazakhstan which have increased their purchases from Kyrgyz producers despite the transport costs and border problems.

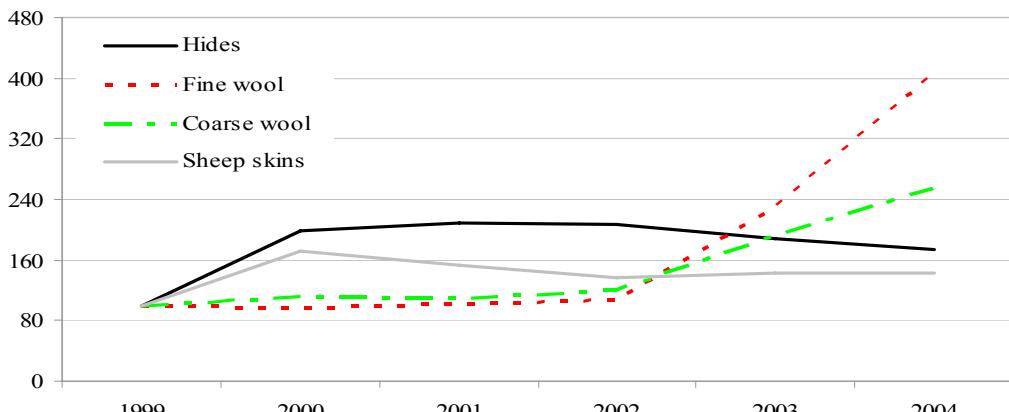
Figure 5: Producer price index for livestock products (1999=100)



Source: Natstatcom, KAMIS.

Prices have increased dramatically in the wool sector, with greasy coarse wool prices increasing 100% since 2003 and greasy fine wool prices rising by over 300% in the same period. The reasons are the resurgence in the international price of wool, a general shortage in world supply, and the entry into the Kyrgyz market of a large number of Chinese wool buyers (see Figure 6).

Figure 6: Producer price index for livestock by-products (1999=100)



Source: Natstatcom, KAMIS.

There continues to be traditional inter-regional price variation, but many of the regional price differences have narrowed in the past few years, and the differentiation visible now is generally in line with applicable transport costs and wastage rates. Important to note is the sharp effect that the existence of a local processor can have on inflating prices in a given region. The inter-regional price differences are closely linked with the differences in processor demand in the various regions. For example, the price for hides in the south of Kyrgyzstan is lagging behind the national average, and most of this price differential reflects the cost of transportation to processors in the north. Prices in the Chui region have tended to be above the national average, largely due to the operations of Chinese buyers and the proximity to the border crossings and

processing facilities. However, since a number of Chinese buyers have begun to operate in the south, prices there are showing a general increase from the beginning of 2003.

Similarly, milk prices in Osh tend to lag behind the national average. This is due to the lack of processing in the region, lower incomes, and the tendency of consumers in the south to be also producers – limiting the size of the sales market. Because the borders with Uzbekistan are generally closed, the south has little access to export markets.

IV. Supply and value chains

A. Dairy

The vast bulk of milk in Kyrgyzstan is produced by smallholders who generally own 2 or 3 cows. The majority of the excess production is sold to processors through local traders. A small amount is sold by small producers close to urban areas in the local bazaars and directly to consumers by visiting residential areas and selling at the door. However, with rising transportation costs and other demands on the time of family members, this is increasingly considered an ineffective marketing channel. Producers would be able to obtain a better price by selling directly in the bazaar, but the ability to do so depends on being close to a bazaar and having means of transport. Many producers interviewed opined that the extra costs in terms of transport and time make this an unattractive option that they will use only if they have problems accessing other sales points such as a local trader.

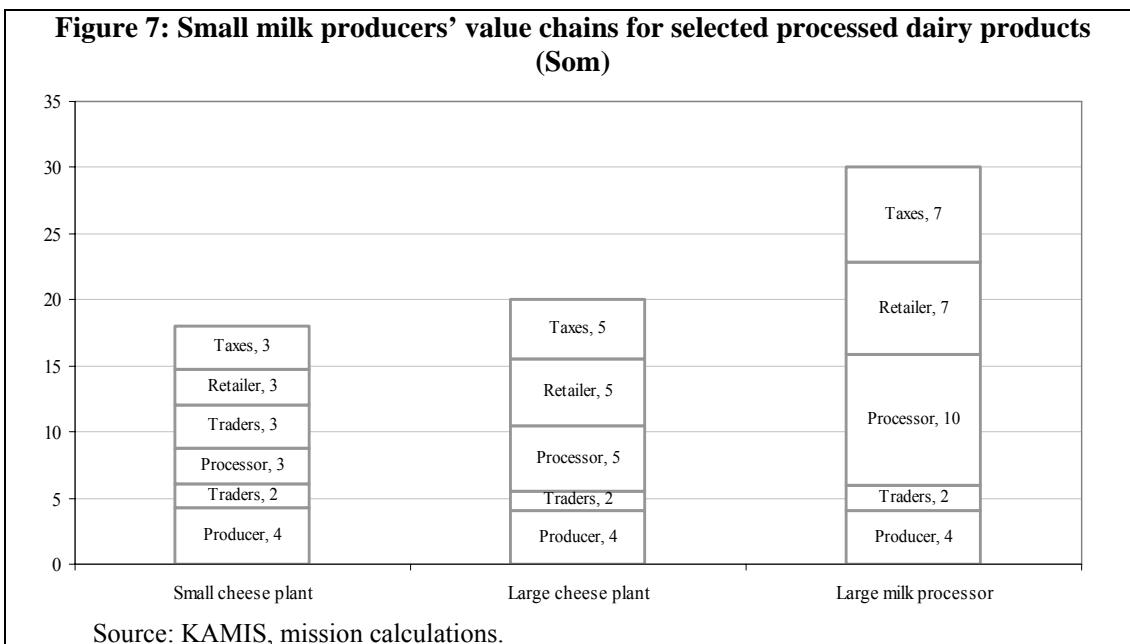
Local traders collect raw milk daily from local collection points or by taking a tanker around the village. They keep a record of each individual's deliveries and maintain an account with each of them. These traders have two main sales outlets: processors and direct exporters. Direct export is especially practiced in the areas bordering Kazakhstan, where Kazakh milk processors send their tankers to collect raw milk. To sell to a processor, the local trader enters into an arrangement with the processing plant to supply raw milk. In the vast majority of cases, this relationship is informal and not based on a written or registered contract, enabling the trader to operate outside of the legal parameters (specifically for payment of taxes). The processor runs an account with the trader, with payments generally made on a bi-weekly cash basis.

Large processors are not common in Kyrgyzstan and tend to have a degree of foreign ownership. They usually have their own collection vehicles and take delivery at village collection points. Some are relatively sophisticated, possess new processing equipment and technologies, and produce a wide range of products in modern packaging and with distinct branding. They tend to sell through only three channels: direct distribution to retail outlets, wholesale from storage facilities in Bishkek, and export.

For small processors who do not possess tankers, traders tend to deliver the milk (normally in churns, as opposed to tankers). Small processors are based around severely downsized former state-owned plants, newly created mini-dairies or family-owned operations that generally operate outside of the official economy. Their production is manual and limited to white cheeses, yogurts and butter. Packaging tends to be unsophisticated, and there is limited pasteurization of milk prior to processing. Due to lack of operating and investment capital, these processors typically are not able to distribute their products and rely heavily on traders to buy their product and effect further distribution in the chain.

Retailers can take many forms, but the vast majority in urban areas consists of small shops stocking a wide range of domestic and imported products. In Bishkek, supermarkets are making headway in the food retail sector, but the majority of the population still purchases in the bazaars (there are 6 major markets in Bishkek). The opportunity cost of time spent shopping at a bazaar is more than offset by the price advantage over retail outlets. The higher prices charged by retailers are due to their obligation to pay store rent, VAT and various fees; they do not benefit from reduced product purchase costs due to their limited economies of scale.

Figures 7 and 8 present the value chains for small and large milk producers, respectively, with prices based on the summer season. The graphs show the distribution of revenues for one liter of raw milk as it passes through the chains. The calculation of taxation assumes the payment of 20% VAT and 4% sales tax, based on the final sales prices as discovered.



The first chain in Figure 7 represents the sale of milk by a small producer to a local cheese plant through a local trader and the subsequent sale of cheese to the final consumer. The largest margin is made by the producer (4 Som), with the balance being fairly evenly divided among the other actors in the transaction chain. Total taxation on the chain is 3 Som, and this is actually paid at the last point of retail.

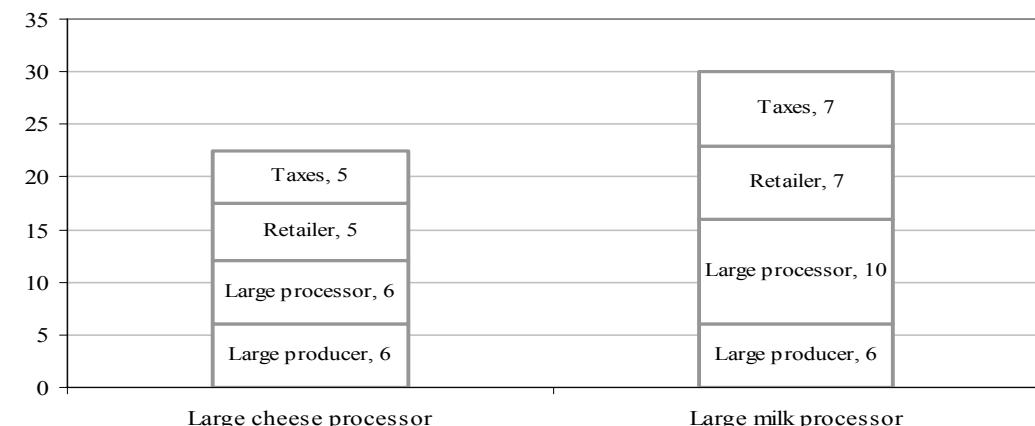
The second chain represents the sale of raw milk from small producers to a large processor through a local trader and the further sale of the cheese to the local consumer. The value shared by the producer remains unchanged, whereas the processor's and retailer's margins are higher than in the first chain because the chain is shorter and the final sales price is higher. Total taxation now amounts to 5 Som and is collected at two points – the processor and the retailer.

The third chain represents the sale of milk by small producers to large processors through local traders for the production of pasteurized milk which is then sold to consumers. The largest return in the chain is made by the processor (10 Som), due to the relatively high net margin. The producer's share is sharply lower (only 20%) because of the high price for pasteurized milk in comparison with raw milk. Total taxes are 7 Som, or 24% of the total value of the chain.

The first chain in Figure 8 refers to direct sale of milk by large producers to large processors, with the cheese sold through retailers to final consumers. This increases the shares of both producer and processor and reduces that of the retailer. The increase in the producer's margin is due to a higher milk price (6 Som) and the absence of a local trader in the chain. Processors also have a larger margin (6 Som) than in the second chain in Figure 7, because the better quality of the milk allows a reduction in the amount of milk in the final product (cheese). The lower share of milk in the final product also results in an unchanged level of taxes (5 Som). The second chain represents the direct sale of milk by large producers to large processors and the onward sale of pasteurized milk through retailers. The processor's share increases to 10 Som, and the margin for retailers rises to 7 Som. Taxes total 7 Som.

These calculations show that the most lucrative business for large processors is the producing and sale of pasteurized milk. However, there are at present very few companies operating in this sector and they are targeting the high-end consumer market with attractive packaging and advertising. Hence, while this may be a lucrative business for them, it does not represent a large proportion of their sales.

Figure 8: Large milk producers' value chains for selected processed dairy products (Som)



Source: KAMIS, mission calculations

For cheese, the difference between the sales prices of large and small processors does not mean that the latter could increase their price (80 Som/kg) either to the final sale price of their cheese at the bazaar (110 Som/kg) or to the price at which the larger processors sell their cheese wholesale (120 Som/kg). The ability of small-scale processors to increase their prices is constrained by the large number of competing small processors, their lack of product quality and differentiation, and their inability to distribute their product.

B. Meat and live animals

The marketing infrastructure for live animals in Kyrgyzstan is generally well developed. All major rural areas have live animal markets open on a weekly or bi-weekly basis, and they are well attended by traders, producers and exporters (usually Kazakh buyers). This ensures that prices are competitive and transparent for sellers and there is little opportunity for buyers to act in a collusive manner. Most meat sales pass through the bazaar system, with carcasses having been butchered and consumers generally purchasing untrimmed cuts. Sale is facilitated either by

inter-market traders using their own stalls or by specialist market traders who buy from the former at the bazaar gate. Although some traders have limited overnight cold storage facilities, these operations are largely un-refrigerated and run on a fresh-meat basis, with no freezing of carcasses. Sale at the retail level tends to be slightly more sophisticated, with cuts trimmed and sold using basic cold storage facilities.

Since most producers are smallholders who raise livestock for their own consumption, livestock rearing is not generally perceived as a business venture in itself, and producers do not tend to specialize in it or to hold large numbers of cattle. Larger operations tend to be dairy oriented and the animals they sell are, thus, not beef cattle but older dairy cattle whose milk yield is no longer sufficient. Producer located close to a bazaar or an urban market often choose to slaughter their animals themselves and sell the meat at the bazaar gate. Although there are no official or technical barriers to entry to the bazaar, producers are often confronted with unofficial barriers such as traders, veterinarians and bazaar authorities. In many instances, producers consider opportunity cost of trying to sell products as principals in the bazaar to exceed the small extra profit that they might make. They also find that their ability to supply directly to retailers is minimal, extremely time consuming and therefore not advantageous.

Inter-market traders have a role in the live animal supply chain, but they find that producer access to live animal markets and the tendency for meat processors to buy from these markets or at the farmgate has minimized their role. Inter-market traders are more important in the distribution of meat from rural regions to urban areas and especially to Bishkek. This is explained mainly by their access to transport and to the working capital needed to be able to supply multiple sales points. They are also better equipped to deal with bureaucratic systems and with the rent-seeking attached to the transport of meat within the country.

Most of the Soviet-era large-scale meat processors have closed down. The only one still regularly operating is in Osh; it generally supplies “tushonka” for state supply contracts and operates on a much reduced scale. Most meat processing is done by small operators, the majority of which work outside of the official economy, do not pay taxes, and are not subject to regular health inspections. They have various options for purchasing live animals: live markets, inter market traders and producers. Most animals are purchased directly from producers at the farmgate. Due to the low volumes involved, this is a practical option and enables processors to minimize costs and control quality.

Live animal export consists of the movement of animals to Kazakhstan, mainly through the purchase of animals at the live markets by Kazakh buyers. The main impetus for this came from cheap financing made available to Kazakh farmers to increase their livestock production. This export is generally unofficial, with animals being driven across the porous borders and then registered as being of Kazakh origin. Officials responsible for issuing export permits estimate that about 30% of traded animals go to Kazakhstan in autumn and about 35% in spring. Sales in autumn are of fattened cattle and horses which, after slaughter, go to the Almaty meat markets, while spring sales are mainly of animals for finishing.

Figure 9: Value chains for selected live animals and meat products (Som)

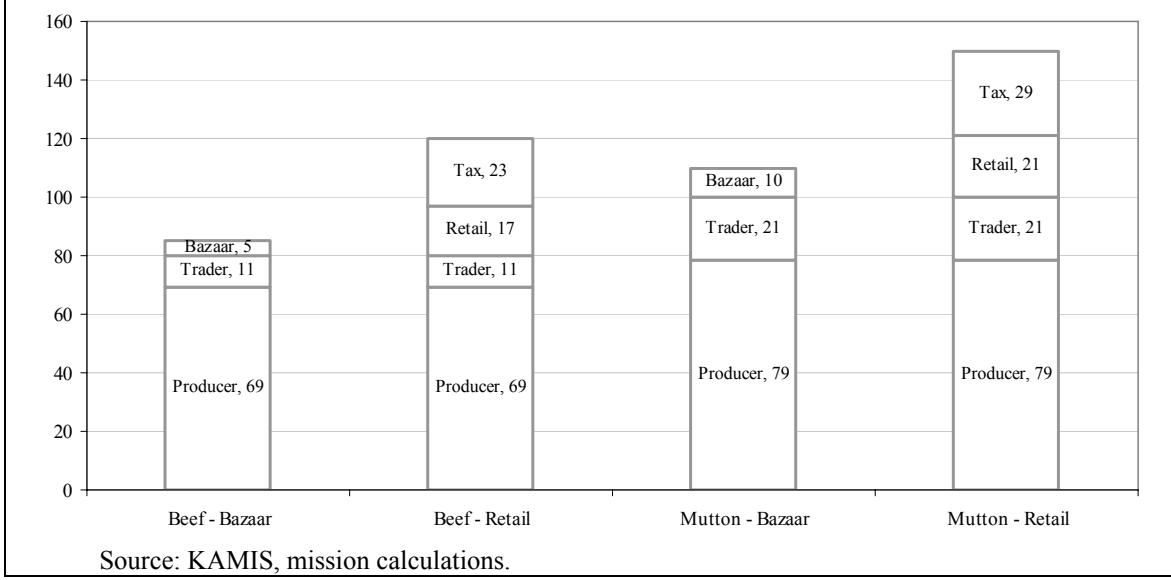


Figure 9 presents the most common value chains for the sales of meat and live animals expressed relative to one kilogram of meat. The first chain on the left represents the sale of live cattle by producers to inter-market traders and then on through the bazaars. The vast bulk of the value in this chain accrues to the producers (81%), while the shares of the inter-market traders and bazaar sellers are relatively small, reflecting the fact that they work on small margins but large volumes. Traders' returns are higher when they purchase live animals and then slaughter them, because they can achieve more weight gain by cutting out the meat than if they purchase carcasses. They also benefit from the revenue of the hide sale of the slaughtered animal. These returns are very attractive for traders, who have minimal investment and are working on volume sales. At almost US\$70/head net revenue and with back-to-back business, traders can achieve very attractive profits. When a trader manages to purchase an animal for less than its actual weight, additional profits are made. The situation is very similar for live sheep, the third chain from the left

The second and the fourth chains represent the sale of live animals as above, but with the meat being sold through retailers. Although producers sell at the same price, their share in the chain decreases, largely because the final consumer price is higher. Retailers are realizing attractive returns (Som 17-21 per kilogram sold), and the value of taxes amounts to Som 23-29. Although much higher than at the bazaar level, revenues need to be higher due to the commitment that has to be made by the retailer in renting or purchasing premises.

C. Wool and hides

Wool. There are two main products from sheep production – meat and wool – and the only poorly functioning supply chain appears to be in the wool sector. A large number of producers are excluded from the supply chain due to the lack of coverage of the traders and semi-processors that are involved in this business. However, the demand for wool (both coarse and fine) has only really re-emerged in the past three years. Wool had decreased dramatically in importance until to 2002, mainly due to poor prices caused by the slump in world prices. Field observations strongly suggest that the number of wool buyers is growing rapidly, and it can

therefore be expected that (subject to continued strong international market demand) much larger volumes of wool will be taken into the supply chain in the coming years.

It should be noted that there are two main types of sheep breeds in Kyrgyzstan – the traditional fat-tailed local breed (meat), and the merino cross which was prevalent during Soviet times and has been re-introduced and improved since about 1998 with support through the World Bank's Sheep and Wool Improvement Project.

The sale of greasy wool from the fat-tailed breeds is not financially attractive to producers. About a third of it is utilized within a producer household. There is little demand for this wool from inter-market traders and semi-processors, largely due to its low quality, but there are a number of processors operating in Kyrgyzstan, the majority of them Chinese. In the main sheep production regions they buy from producers in their immediate area and rely on inter-market traders to source and supply products from a wider area. However, the objective of their operations is to facilitate the export of the original raw material.⁸ Greasy wool only contains around 55% clean wool by weight (the balance being made up of short fibers, dirt and grease), and it is therefore more profitable to semi-process the wool before export. These processors also use this opportunity to grade and sort their produce prior to export.

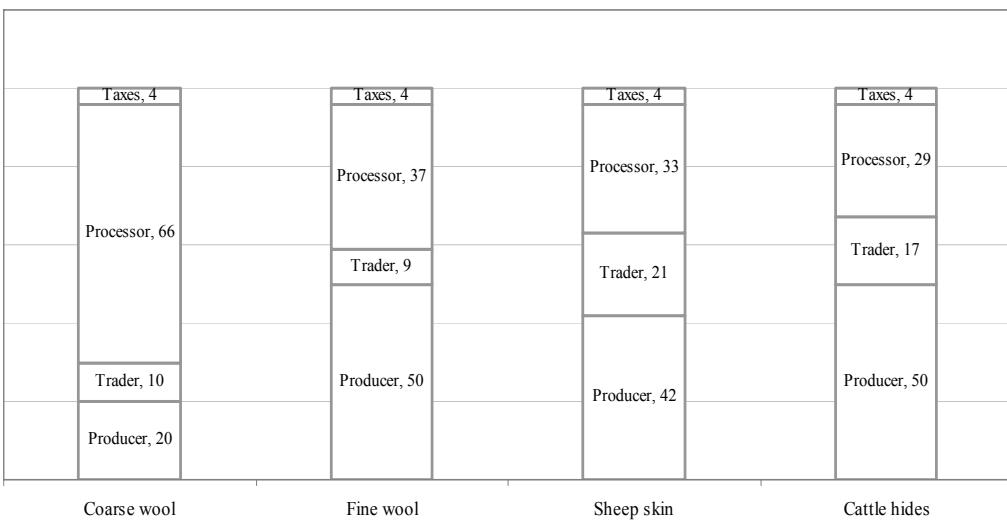
Conversely, the sale of the long-staple white merino wools is quite attractive to producers. However, it is often difficult for them to find buyers because each individual smallholder produces very little (a little as 5 kilograms annually). This requires buyers to purchase from a large number of sellers in order to consolidate a sufficient amount of wool. Producers in an area where there are many such sheep can usually find an inter-market trader or local semi-processor to buy their wool. As a result of the World Bank project mentioned above, producers in this sector have increased their knowledge with regard to quality and grading. There are several organizations that have developed as a result of the increased activity in this sector, notably the Kyrgyz Sheep Breeders Association and the many sheep breeder groups affiliated with it, and they have introduced proper wool classing and sorting procedures in their operations in order to maximize sales prices (see Figure 10).

Most merino wool production takes place at state breeding stations and a few large private farms which have large flocks of sheep. Purchasing by semi-processors and inter-market traders tends to concentrate on these producers. The wool purchased in the market is being semi-processed and then sent for export to Russia and China.

Hides and skins. Where livestock producers are selling cattle on a carcass basis, they realize good returns from the sale of cattle hides. The sale of carcasses produces an attractive margin, but it is considered to be low given the risks associated with animal fatality rates, potential price volatility of both meat and feed, and the time that needs to be invested in this activity (minimum 2 years).

⁸ A legal provision was passed a few years ago prohibiting the export of greasy wool from the Republic.

**Figure 10: Value chains for selected animals by-products
(in percent)**



Source: KAMIS, mission calculations.

Processing of hides and skins is a major business, largely driven by export to China. The semi-processors are in general wholly or partly Chinese owned, and their role is to preserve hides on a wet blue basis, for transport to finishing facilities in China. The processors purchase directly from producers, meat processors and inter-market traders. Normally, the larger the processing facility, the greater the processor's reliance on inter-market traders sourcing raw hides. A number of independent Kyrgyz processors are reported to have entered into supply contracts with buyers in Italy and Turkey.

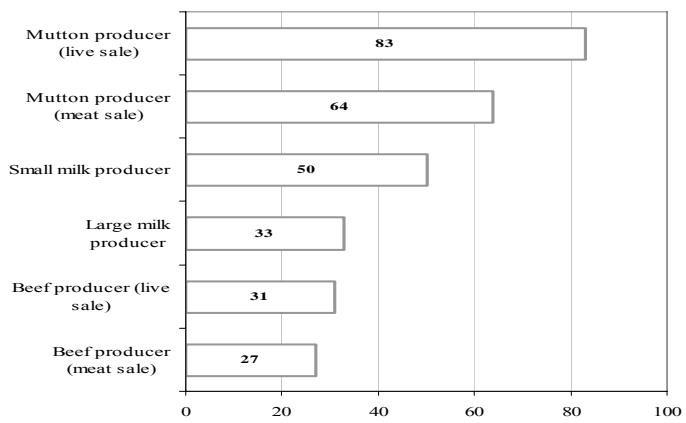
V. Profitability of different market agents

There is considerable private individual enterprise involved all the way along the market chain. Meat delivered to the Bishkek meat bazaar by traders from Naryn and elsewhere may change hands up to three times in a few hours before it is sold to the final consumer. Overall, it appears that while the institutional and physical market infrastructure may be rudimentary, market chains for livestock products operate fairly efficiently. Certainly, market chains and distribution networks are continuing to develop.

The value chains, depicting the return on costs for each participant in the chain, also are basically "equitable". No single participant appears to be making returns that are far in excess of his contribution or role in the overall marketing process. Producers generally realize very attractive returns on their costs, typically in excess of those achieved by their counterparts in other transition economies. For beef they realize a return of approximately 30%, for mutton 80%, and for milk 50%. As noted earlier, price inflation for these products is also running ahead of general consumer price inflation, and the combined effect of these two factors is to provide a general incentive for producers to increase their livestock production.

The situation is slightly different for the larger milk producers. Their cost of production per liter is higher, because they generally operate as feed lots where animals are fed concentrated feed and food additives in addition to regular fodder. Since these operations tend to be located close to urban areas, they also face higher costs for animal feed. They do, however, tend to have much higher lactation rates, in the region of 20–25 liters per day, and fat content of 3.4% and more. Processors pay a premium for the higher fat content and quality of milk. As a result, the returns are on the order of 33% on costs – an attractive and sustainable margin.

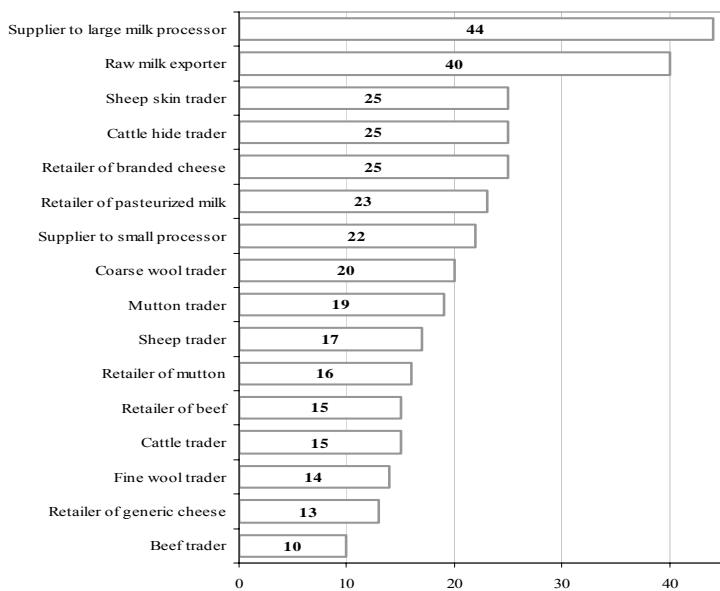
Figure 11: Producer returns to costs



Source: KAMIS, mission calculations.

Inter-market traders do not appear to be making returns that suggest that the producers are severely disenfranchised from the market. Inter-market margins are in the 15-19% range which, while quite profitable, do not constitute an excessive margin. As in many other transition countries, inter-market traders exist because they have the financial and transport means to make a margin in the re-sale of goods. They generally have superior knowledge of market prices and are able to benefit from the movement of goods to capitalize on this. In Kyrgyzstan, however, producers appear to have good knowledge about prices in non-immediate markets. This is partly due to the small size of the country and information being shared within extended families in differing locations, and partly due to the provision of regular market information to farmers by the Kyrgyz Agricultural Market Information Service (KAMIS) in journal form, in local newspapers, through public postings, in national and regional radio and television broadcasts, and through the Rural Advisory Service (RAS).

Figure 12: Trader returns to costs



Source: KAMIS, mission calculations.

Inter-market margins for raw milk sales are higher (22-44%), because of the dominant position of the inter-market traders in the supply chain. They fulfill an important function, but their returns are high -- given their minimal costs and limited operational activities. The returns for traders in regions bordering Kazakhstan (where raw milk is exported) are even higher – on the order of 40%. This reduces the margins for producers and also affects the ability of processors to

use incentive payments to induce producers to improve the quality of their milk. Unless the local traders pass the quality premiums on to the producers, processors will see little or no quality improvement from the introduction of quality-based payments. Unless producers organize themselves in order to consolidate their raw milk supply for the market, they will not be able to improve their bargaining position and, thus, their own returns at the expense of the traders.

As shown in Figure 13, processors also appear to make quite normal returns on costs (around 30%). Given the capital investment and operational management required, these returns are reasonable. In some subsectors processors' returns are higher: in the pasteurized milk sector, for instance, returns are 60%, which is very high. These processors benefit from access to a limited number of higher-income consumers, face little competition, and can maximize returns through targeted advertising and modern packaging.⁹

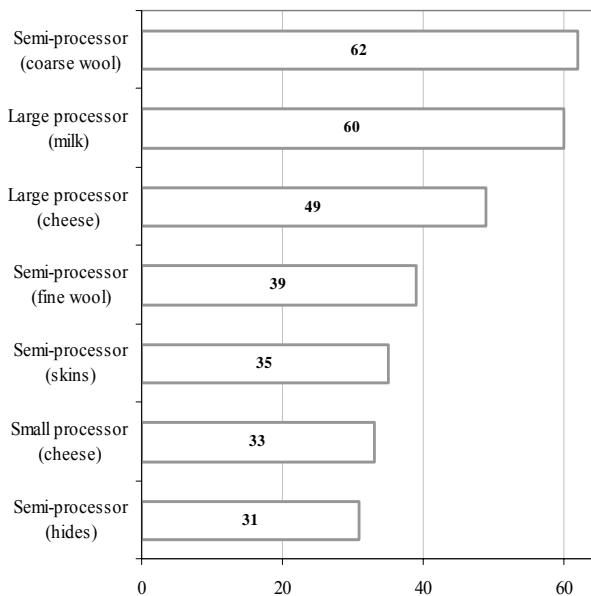
VI. Supply chain issues and problems

Lack of marketing skills. Many processors still operate under the supply-driven concept of production. There is little product differentiation or ability to tailor production to market signals, and the quality of processed goods rarely matches that of competing products (domestic or imported). Most processors are simply selling, rather actively marketing their products. While a small number of processors are beginning to develop their businesses in this area, the prevalence of outmoded business practices poses a threat to the medium- to long-term sustainability of all the others.

Fortunately for Kyrgyz livestock producers, their products are in relatively high demand, and they therefore do not have to “chase the market”. However, if production or imports were to increase or if demand were to fall, many producers would find themselves in a very difficult position, with no viable exit strategy or means of increasing their returns through applied marketing. The continued disconnect between production and consumption, between producers and processors/consumers, will hamper growth of the sector, put downward pressure on producer prices, and severely limit the sector's ability to react positively to changes in the demand profile.

Administrative obstacles to exports. Raw milk is not typically considered a viable export product, due to the problems and costs of transport and of maintaining quality, but there is considerable scope for dairy exports to the Kazakh regions bordering Kyrgyzstan. However,

Figure 13: Processor returns to costs



Source: KAMIS, mission calculations.

⁹ Wool processors are also generating returns of 40-60%, above typical processor levels, but these are in effect exporters who carry out initial cleaning in order to reduce transport costs and allow sorting at origin.

Kyrgyz processors consider exports of products such as cream, cottage cheese and yogurt not feasible. The main problem is that the procedures to enable exports are very difficult to execute at the border crossings, and the perishable nature of the product therefore causes major problems. Although they have a price advantage over the Kazakh dairy industry, they are unable to realize this due to their inability to actually effect exports. Their ability to compete on price is also greatly hampered by their factual inability to reclaim VAT on exports. While Kyrgyz law provides that VAT on exports is reclaimable, it is almost unachievable in practice (see below). This means that the price at which they sell has to include VAT (currently 20%).

Processors are having more success with the export of cheese, because this is a far less perishable product and lengthy border delays therefore do not result in spoilage. It is worth noting that the processors engaged in this business produce high-quality cheeses and ship in modern vacuum packaging for direct distribution to the retail market. Despite suffering the same VAT recovery problems, they are able to charge sufficiently high prices to ensure profitability.

Institutional environment and governance. The institutional environment and governance standards in agricultural product markets are poorly developed, and this gives rise to various problems:

- While there is legislation and regulations, their application is unpredictable and often used for rent-extraction: reimbursement of the VAT on exports, for instance, typically requires significant (allegedly up to 40% of the amount to be recovered) unofficial advance payments to government officials before a refund will be provided.
- Legislation and regulations are in place concerning the registration and taxation of businesses involved in foodstuff production – but the domestic market is dominated by products that are produced by unlicensed processors who do not pay taxes or necessarily adhere to health and safety requirements. Not only this is a major risk to public health, but it also greatly impedes the development of a formal and registered processing industry because it will not be able to compete with untaxed and unregulated operators.
- There is a general lack of forward contracting among processors and buyers, especially for sheep products (see Table 14); the main reason appears to be low confidence in the legal system and the enforceability of contracts.
- A problem faced by producers of goods that are both primary and consumable (e.g., fine wool) is the absence of independent quality certification or verification; with fine wool at present in high demand, the problem is masked because buyer competition compensates for the lack of producers' bargaining power, but once supply increases this could develop into a serious problem.

Table 14: Incidence of sales contract/agreements in 2003			
	Written contract	Oral agreement	No contract or agreement
Cattle			
Milk	3%	49%	48%
Meat	3%	31%	66%
Hides	1%	21%	78%
Live animals	1%	7%	92%
Sheep			
Wool	0%	36%	64%
Meat	0%	10%	90%
Skins	0%	19%	81%
Live animals	0%	13%	87%

Source: Basis Farm Survey (2003)

Product assembly and quality. Many processors claim that the fragmented nature of primary production makes it difficult to secure sufficient supplies. The dairy sector, for example, is characterized by a very large number of small producers, causing logistic and accounting problems for processors who are unable to cope with direct purchasing from such a large number of suppliers. It also makes it very difficult for them to improve the quality of the supplies they receive: providing premium payments for high-fat milk does not work unless the intermediaries pass on these premiums to the producers and do not retain them for themselves.

Quality standards. Although a member of the WTO, Kyrgyzstan has been slow to harmonize its domestic standards with those of the Codex Alimentarius.¹⁰ It should be a priority for the Government to expedite the harmonization of standards for those products that are exported or expected to be exported from Kyrgyzstan. (Harmonization is not necessary at the early stages for the entire range of agricultural products contained in the Codex.) Meeting the WTO health and safety provisions for food products is of critical importance for the development of any export-oriented business. Both Kazakhstan and Russia, traditional Kyrgyz export markets, are moving rapidly to harmonize their domestic standards for food products with the Codex Alimentarius. Once these countries have done so, Kyrgyz exporters will face the same high standards whether they are trying to export to Russia, to Kazakhstan or to the EU.

Finance. The general shortage of rural credit is especially problematic for dairy and beef producers. The rural credit finance currently available is only on a short-term basis, and the lack of longer-term credit means that producers cannot increase their livestock herds through the purchase of animals and instead have to breed their own.

The processing sector also suffers from lack of finance, as the ability to borrow is directly linked to the ability to provide physical collateral (typically buildings). The high collateral discounting rates applied by banks further limit processors' ability to raise funds. The inability or unwillingness of domestic banks to accept other forms of collateral or to finance business transactions is, thus, a major impediment to growth. Leasing packages are available, but they are generally of a buy-back nature and equipment "purchased" through this type of facility is subject to VAT. By contrast, equipment purchased directly and declared as a contribution to the

¹⁰ The international standard for food safety principles developed by FAO and WHO.

company's capital fund is not subject to VAT. Buy-back leasing does not allow this and is therefore an unattractive financing instrument.

Processors also face seasonal working capital shortages. They need to purchase large volumes of raw material when it is seasonally available and then sell it over an extended period or out of season – causing an imbalance between expenditure and revenue flows. The obvious solution – stock-collateralized finance, or a stock-collateralized overdraft facility – is not available in Kyrgyzstan, although a small amount will become available under a new IDA-supported Agribusiness and Marketing Project. The lack of seasonal working capital has an adverse impact in the wool sector, for example. There are a few organized purchasing agencies for fine wool, their ability to purchase larger volumes is severely hampered by the lack of working capital and they are therefore unable to satisfy the large demand for wool exports.

VII. Key recommendations

Market associations. The problems of fragmented production and disenfranchised producers can be addressed through the facilitation of marketing groups and association. These organizations must be based on producer demand and centered on a product nexus, as opposed to a purely geographical or physical locus. The actions of producers within the groups need to be based on the profit motive, as opposed to the organizational credo. Other support services – such as offtake contracts with traders or processors, market infrastructure, and business service development -- can then be delivered much more efficiently. In the dairy sector, producers and processors would both benefit from the creation of marketing associations based on chilled milk storage tanks. This would allow large groups of individual producers to conclude supply contracts with processors and to link themselves more directly into the supply chain. Processor incentives, such as premium payment based on quality, could then be introduced.

In the wool sector, where exporters and processors face enormous problems with consolidating sufficient volumes for shipment or purchase, marketing associations would enable producers to consolidate parcels of wool for direct sale to processors, without having to wait for the intermediation of inter-market traders. Bulking up their individual quantities into larger parcels of wool would also improve their bargaining power and their ability to obtain higher prices. Such associations could also provide delivery platforms for business advisory services that are clearly required in this sector to increase producer efficiency and sustainability. Over time, this could be expected to lead to increased local processing and the creation of processing SMEs.

Finance and leasing. There is an obvious need for longer-term financing which would benefit not only the livestock sector but also other agricultural subsectors such as horticulture. Credit facilitation will be greatly helped by streamlining application and documentation requirements and easing of the banks' collateral policies. Many of the issues that concern risk and collateral would benefit from a reform of enforcement regulations and the widespread use of commercial arbitration courts.

While it can be argued that the banking system needs time to develop before it can handle large increases in liquidity, the livestock sector does not require a general increase in agricultural credit volume, but specific types of credit: medium- and long-term working capital credit for primary producers, and medium/long-term capital investment and short-term stock-collateralized working capital credit for processors and exporters.

The processing sector needs effective leasing packages that enable processors to replace outdated equipment. Such facilities should qualify for the important incentive of being exempt from VAT on capital fund investments. Improving the ability of processors to borrow also requires credit lines that enable domestic banks to enter into more transaction-based financing, where they can mitigate or control their risk through pledged inventory and/or payment tools.

Technical standards. It is very urgent to bring domestic legislation and regulations in compliance with WTO requirements. This involves, *inter alia*, establishing a reference laboratory for food technical standards and to have it registered and accredited with the requisite international organizations. This national reference laboratory will then be able to serve a wider network of independent laboratories that will be in a position to issue quality certificates in accordance with international standards. Kyrgyzstan will require financial and technical assistance to implement this.

Rehabilitation of market infrastructure. Much of the former infrastructure (e.g., slaughterhouses and cold storage facilities) has fallen into disrepair. Exports cannot be increased without such infrastructure, and it must conform to international standards and quality requirements. As much of this infrastructure would benefit large groups of producers and therefore should preferably be owned and operated by producer groups or associations, there is justification for making available matching grants to finance construction. The provision of such grants should be conditioned upon the facility being certified as complying with the relevant international standards (e.g., HACCP, ISO, etc.). Part of the grant could be provided specifically for obtaining the required certification by an independent body.

Trade Promotion. To be successful, trade promotion activities need to be very carefully structured and implemented. Kyrgyzstan has a long history as a producer of quality livestock and livestock products, and this is an asset that can be built upon. Initial campaigns should be directed at traditional markets in Russia and Central Asia, and they should be coordinated with members of the private sector who are in a position to follow up with actual business transactions.

Chapter 4

Animal and Human Health

I. Introduction

The changes in livestock management systems, the end of the guaranteed supply of vaccines and drugs, and the deficiencies in the current animal health service delivery system have combined to bring about an increase of animal and animal-related human diseases. Although the full dimensions of the incidence of many of these diseases cannot be accurately assessed due to deficiencies in the diagnostic system, statistics compiled by the Ministry of Health indicate that the situation, especially in the case of brucellosis, is grave and needs swift and determined action. Possible future outbreaks of Avian Influenza would expose the deficiencies even further.

While the contribution of private veterinarians to animal health care in the country has increased tremendously, the recently approved veterinary law does not suggest a clear policy and strategy on how the public-private collaboration is to take shape and flourish. The recently formed National Association of Private Veterinary Practitioners has experienced the heavy hand of the government in its formation, and although this association is a starting point for a structured relationship between public and private veterinary services it will need a lot of time and effort to develop into a true membership organization and not a franchisee of the state veterinary services.

The vision on the future of the animal health service delivery system in Kyrgyzstan is still unclear, yet decisions determining this future have been taken already. Kyrgyzstan has become a member of the World Trade Organization (WTO) and will have to comply with its food safety requirements for both international and domestic markets and with the regulations of the International Office for Animal Health (OIE) on animal health provision and reporting. With large neighbors recently having joined (China) or intending to join (Kazakhstan) WTO, it is essential for Kyrgyzstan to develop its animal health care system according to the requirements of WTO membership.

II. Challenges of the Transition

The problems with the animal health situation in Kyrgyzstan do not originate only from the obsolete laboratories and lack of funds, but mainly from a completely changed structure of the livestock sector without adequate and timely modifications of the veterinary services. With the agrarian reform, the comprehensive and state-funded veterinary services formerly provided by the collective and state farms ceased to function. Veterinary drugs no longer arrive without payment made on the spot. When the animals were distributed among the farm workers, the veterinary services lost their direct link with the animals. The established input and output distribution chains collapsed and a wide range of alternative processing (often home-based) and marketing systems developed, in most instances without veterinary oversight.

These changes have brought serious challenges for the staff of the State Veterinary Department (SVD). Instead of working only with the veterinary fraternity in the state and collective farms, they now have to interact and communicate extensively with numerous individual livestock producers, private veterinarians, consumers and their organizations. Moreover, WTO membership has added a commitment to communicate about animal health, trade and food safety

issues at the international level and to develop a domestic food safety assurance system that is compliant with the Codex Alimentarius.¹¹

Vaccination coverage of the livestock population and availability of quality veterinary drugs has decreased dramatically. Due to budgetary constraints, the number of diseases for which the SDV intends to have an active control campaign has been reduced from 45 to 5: brucellosis, Foot and Mouth Disease (FMD), anthrax, sheep pox, and rabies. The vaccines against these diseases currently distributed free of charge only cover some 50-60% of the animals that should be vaccinated. The state has ceased to supply veterinary drugs except for a highly inadequate number of Echinococcus treatments. The former "Zoovetsnab" outlets have been privatized. In the absence of an effective supply mechanism, a large portion of the veterinary drugs available in the market enters the country illegally. These drugs often lack use instructions in Russian and Kyrgyz, and incorrect use by farmers, veterinarians and vet assistants is widespread.

Reliable diagnostic data to assess the status of various livestock diseases are lacking. The root causes of the decrease in disease surveillance are shortage of funds for travel, transport and reagents, the poor state of most laboratories, and low morale of the underpaid staff working in the laboratories. None of the 37 veterinary laboratories currently meet international standards (ISO 17025).¹²

It is clear that the animal health care system in Kyrgyzstan is still in transition from its Soviet past and that the final stage of this transition is far from being reached, although the direction of where the transition should lead to has already been defined. Kyrgyzstan has become WTO member in 1998 and this has brought with it additional international requirements for the veterinary services to comply with. Apart from controlling animal diseases, WTO accession meant a major commitment to the development of a Codex Alimentarius compliant food safety assurance system in Kyrgyzstan.

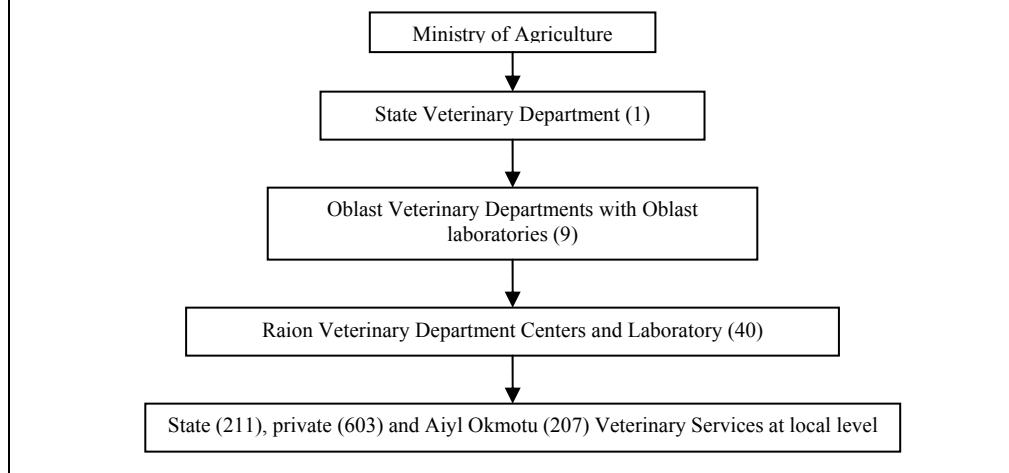
III. Current Status of the Veterinary Services

The State Veterinary Department (SVD). The governmental veterinary service is, in principle, still structured as in Soviet times. It is hierarchic and top down, with subordinate units at the oblasts, raions and rural municipalities (aiyl okmotus). There are some 210 SVD veterinarians at the raion level and a similar number of veterinarians/veterinary assistants at the aiyl okmotu level; those at the aiyl okmotu level are employed/paid by the aiyl okmotu.

¹¹ The international standard for food safety principles developed by FAO and WHO..

¹² ISO/IEC 17025 = International Organization for Standardization/International Electrotechnical Commission's standard for the competence of testing and calibration laboratories.

Figure 14: Structure of the Kyrgyz Veterinary Service



There also are an estimated 800 private veterinarians and about 600 registered private veterinary practitioners, released from public service since the country regained independence, but this latter figure is probably an underestimate because the cost of registration is a disincentive for some who operate without registration.

The basis of all operations for both the state and the private veterinarians is the annual plan, prepared by the anti-epizootic department in the SVD, which stipulates exactly when which oblast has to do what. Reporting is done with the annual plan as the basis. Private veterinarians are supposed to report to the raion veterinarians, who report to the oblast veterinarians, who at regular intervals travel to Bishkek to report to the SVD.

Veterinary Militia. The Department of Militia on Boundary Veterinary Control Posts is a special service under the joint oversight of MAWRPI and the Ministry of Internal Affairs. Its main functions are to monitor border crossings and road checkpoints within the country. It is a para-military service, headquartered in Bishkek, with a southern and northern subdivision and six platoons stationed in the oblasts who staff 27 permanent checkpoints and any temporary ones that may be set up at any particular time. Total staff strength is about 190, including 155 field staff. Few are trained in veterinary sanitary procedures. At the checkpoints, veterinary certificates and other cargo documents are checked; cargo is detained until documentation is in order. In fact, none of the boundary posts or checkpoints are equipped according to boundary quarantine post requirements, and none have any facilities to quarantine animals or keep animal products in safe seclusion. Only 7 of the 27 permanent posts are in buildings of standard construction; the others operate in vans or old and unsuitable premises. All lack effective communications equipment.

The militia does not operate entry/exit control posts at the most important border points – the airports, railway border crossings, and the two road crossings with China; these are operated by the SVD itself.

Laboratories. The countrywide network of veterinary laboratories is centered on the Republican Central Veterinary Laboratory (RCVL) in Bishkek as national reference lab; it also serves as Chui oblast laboratory. There are six oblast-level, 21 raion-level and 7 inter-raion laboratories. In accordance with OIE regulations, the central veterinary laboratory is functionally under the

SVD. The central lab functions as reference lab and should play a major role in quality control of the other laboratories through the organization of ring testing, production and distribution of reference sera, etc., but there are no means to execute these tasks. The central lab has the only ELISA¹³ equipment in the veterinary services, but lack of funds to procure test kits renders it practically inoperative. Over the past 15 years, the number of staff in the national laboratory has declined from 200 to 60.

The oblast and raion laboratories used to have almost identical testing capacity, with facilities for serology, bacteriology, parasitology, virology, disease diagnosis and monitoring. The raion laboratories today are largely non-functioning, due to staff cuts, broken equipment, lack of materials and frequent electricity outages. More and more samples are referred to oblast level. Most staff are of an advanced age, and the lack of in-service training has them increasingly out of touch with advances in their field. Staffing at the Osh oblast laboratory has declined from 300 to 75 over the past decade, at Karakol from 180 to 22, and at Naryn from 120 to 66.

There also are a number of small inspection laboratories (usually one or two room operations and located in bazars) responsible for checking milk for brucellosis, density and fat content and for organoleptical inspection of meat. Meat inspection has become inadequate. Although the rules require both pre- and post-mortem inspection, most animals are slaughtered in the back yards without either. Traders carry a veterinary permit stating that the animal was free from contagious diseases. This permit is usually issued by the state veterinarian, but since it commonly are private veterinarians who vaccinate or conduct the serology test for brucellosis it is impossible for the state veterinarian to consider the animal's health status. It is widely considered that these permits are a means for veterinarians to augment their income and an admission ticket to the market, but that they hardly function as a means to protect people's health.

Vaccines. The quality of vaccines procured by the SVD does not conform to reliable and internationally accepted quality standards. The SVD has the exclusive right to import and/or procure vaccines against list A diseases. This is usually done through an annual public tender, with funding provided through the EU Food Security Program. The tender requires only a quality declaration by the public veterinary service of the country from where the vaccines are imported. There is only one local vaccine producer, Altyn-Tamyr, and for vaccines procured there a declaration of the factory's own laboratory is considered sufficient. Altyn-Tamyr's filling department has a "Good Manufacturing Practices" plan in operation, but the absence of local auditing capacity for such systems and the absence of such systems in the other departments of the factory preclude its being able to guarantee the quality compliance of its vaccines with international standards. At present, the factory is unlikely to pass an OIE compliant quality test of vaccines or to meet an international quality management standard for its manufacturing and laboratory facilities (ISO 17025).

¹³ Enzyme Linked Immuno Sorbed Assay.

Box 1: Vaccination Strategies and Practices

The availability of the vaccines listed below is the sole responsibility of the State Veterinary Department. Unfortunately, SVD has not been able to ensure sufficient availability of these vaccines, of the right type and in the right quantity.

Continued

Sheep are supposed to be vaccinated with S19 once or twice per year against **Brucellosis**, before the mating season and after giving birth. Actual vaccination coverage in sheep is low, however; some estimate it at less than 40%.

Foot and Mouth vaccine should be given two times a year to all cattle, sheep and goats. There is not sufficient vaccine available to achieve full coverage, and currently only border areas and areas with known outbreaks are covered. For the Asia I strain, which emerged during 2003/04, animals have to be vaccinated for the second time after 20-21 days, then at three months, and then every six months. Many veterinarians and veterinary assistants were not able to follow this vaccination scheme because they did not know this and/or did not have enough vaccine. Field surveys suggest that actual coverage amounted to less than 50%.

Anthrax vaccine should be given once a year only to animals in areas where anthrax is endemic or had occurred before. Field reports indicate an actual coverage in 2004 of between 35 and 55%.

Rabies vaccination should be given once a year to all dogs, but actual coverage seems to be between 25 and 50%.

The effectiveness of the locally produced vaccines is in serious doubt, partly because of the lack of modern quality control system in the factory, but also due to inadequate handling, storage and distribution. In the absence of a cold chain, vaccines are transported in normal cars and trucks to oblast centers and then to raions and to village veterinarians. Similarly, because of the lack of cooling facilities, village veterinarians try to keep the vaccines cool in their cellars. Although most veterinarians can manage to complete a vaccination campaign in one to two weeks, this is too long for a live vaccine that requires cold storage to remain effective.

Source: Livestock Sector Stakeholders Survey.

The reliability of official statistics on vaccinations depends critically on the reliability of reporting by the private veterinarians. Vaccines are distributed free-of-charge to the private veterinarians, who are allowed to charge farmers for administering the vaccinations and have to report to the state veterinary service on the vaccinations they have performed. Frequently, the vaccine is no longer effective by the time it reaches the village and is simply discarded. In other cases, the number of animals to be vaccinated exceeds the number of vaccine doses available. To cope with these problems, private veterinarians often obtain vaccines from traders who import vaccines from elsewhere.

Veterinary Drugs. The past system of state distribution of veterinary drugs through the “Zoovetsnab” outlets has been replaced by private operators. The registration of veterinary drugs and vaccines, previously the responsibility of the SVD, has recently been shifted to the Drugs Registration Unit of the Ministry of Health, but according to the new veterinary law SVD is to regain this responsibility. Accordingly, the SVD has initiated the preparation of a suitable laboratory, but the budgetary resources are insufficient to do this to the required standard.

Currently, there is a list with 117 registered drugs and vaccines, and a further 13 applications are pending approval.

The SVD has always been responsible for the issue of import licenses for veterinary drugs and vaccines. Importers of veterinary drugs estimate the annual value of domestic demand to be in the range of US\$500,000 to US\$1,000,000. However, there is only a limited number of officially recognized and licensed dealers in veterinary drugs, and they face stiff competition from illegal importers, partly because little or no action is taken against the latter. During 2003-2004 only 18 import licenses were issued, and most of them for only one importer.

Association of Private Veterinarians. With support from the EU-funded Food Security Program, a private veterinary association has been established, with oblast and raion level associations at the lower levels. The founders of the national association comprise a somewhat unusual set of stakeholders: seven oblast-level private veterinary associations, the Altyn-Tamyr Bio-Factory, the Dog Breeders Association of Kyrgyzstan, and the veterinary drugs supplier Zoovetsnab Bishkek. The national association claims to have 63 physical and 92 corporate members, but is not very active. Membership in the oblast-level associations is reported to be around 600. The association suffers from a widely perceived lack of legitimacy, unclear objectives, and its unusually close links to the SVD and to the formerly state-owned, but now privatized vaccine factory Altyn-Tamyr. The president of the association is director of the factory, and its executive director is an employee of the SVD and reports to the Director General of the SVD. Many private veterinarians refuse to join the association, as they perceive it to be an instrument of governmental control over the veterinarians made redundant during the various cuts in SVD staffing.

There are differing views about the objectives and tasks of the National Association. At oblast level, its principal role is seen as implementer of the regional veterinary plan and vaccination targets; at national level there is more of a vision that acknowledges the need for a functional separation of the state and private veterinary bodies, which is yet to be developed and documented in the law. It is also seen as a potential supplier of affordable drugs to its members.

Bio-Safety and Animal Carcass Disposal. There are no rendering plants in the Kyrgyz Republic. Disposal of animal carcasses is done through burial or biothermal decomposition. Animal owners are, by law, required to inform a veterinarian when an animal has died, and the veterinarian is supposed to inspect the animal and decide if further bacteriological, virological or other tests are required. If not, the carcass is to be disposed of either in an official animal burial ground or a biothermal disinfection facility ("Bekkari hole"). There are, officially, 93 cattle burial grounds and 47 Bekkari holes in the Republic. It is prohibited to bury animals anywhere else.

However, with the dissolution of the state and collective farms, these facilities were transferred to the rural municipalities (aiyl okmotus), and the widespread scarcity of financial and other resources in the aiyl okmotus has caused most of these facilities to fall into disrepair and disuse. In practice, many farmers do not report the death of animals, but dispose of them in any manner convenient to them. This may, and reportedly often does, involve their illegal processing into marketable food products, posing high risks to consumers. Reports of food-induced human illnesses traceable to the consumption of products purchased in local markets are frequent.

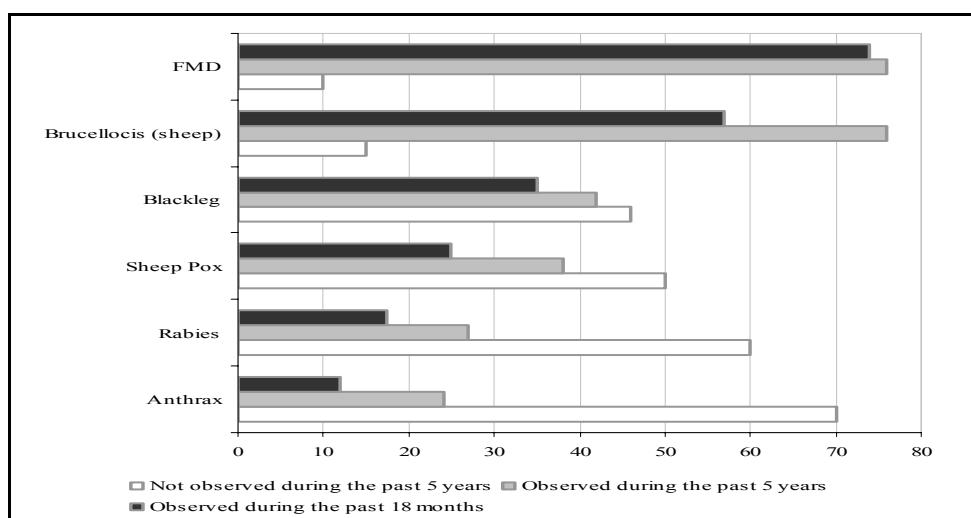
Table 15: Burial Grounds and Bekkari Holes by Oblast

Oblast	Burial Grounds	Bekkari Holes
Batken	6	5
Chui	36	9
Issyk-Kul	18	7
Jalalabad	16	15
Naryn	11	4
Osh	6	7
Talas	-	-
Total	93	47

Biothermal holes, or Bekkari holes, are structures of standardized design for the destruction of animal carcasses. In the absence of rendering facilities, Bekkari holes provide effective carcass sterilization and, thus, a high bio-safety and sanitary status at livestock establishments. They are constructed on dry high ground, at least 300 m from livestock sheds, processing facilities, rivers, ponds and wells. The hole itself is 10-12 m deep, with a diameter of 2-3 m. The facility is constructed of moisture- and thermo-resistant material, with a hermetic cover and a ventilation system. The biothermal decaying process is completed within about 35-40 days after being loaded with animal carcasses, with the formation of uniform and odorless semi-liquid compost, suitable for fertilizing. The biothermal hole has a significant advantage over burial grounds in that it causes fairly rapid destruction of many microbes.

IV. Major Animal Diseases

Views on the severity of animal disease incidence vary considerably. Government veterinarians in the oblasts and raions contend that the incidence of infectious diseases is decreasing and that an effective control mechanism is in place. Farmers and private veterinarians, conversely, paint another picture, one of an ever increasing incidence of and problems with infectious animal diseases. For the present review, various data sources were consulted, including diagnostic reports from veterinary laboratories, SVD reports, statistics compiled by the Ministry of Health (MoH), and information provided by private and state veterinarians interviewed during field visits.

Figure 15: Respondents' Observation of Major Animal Diseases

To obtain a better picture of the animal health care situation, a rapid field survey of stakeholders was also used,¹⁴ which confirmed a numbers of points encountered during the field work. The questions focused on the most important diseases: Brucellosis, Foot-and-Mouth Disease, Anthrax, Rabies, Sheep Pox, Blackleg. Figure 15 illustrates the respondents' observations regarding diseases observed in their respective localities.

The above numbers confirm what other data sources suggest, but SVD officials tend to downplay: outbreaks of major infectious animal diseases are widespread and frequent. They severely impact the productivity of the Kyrgyz livestock sector, and they pose significant risks to human health, especially in rural areas. MoH records confirm that this risk to humans is not merely hypothetical, but an unnecessarily frequent reality. Unfortunately, the data reported by the SVD and by MOH tend to differ substantially, casting serious doubt on the reliability of the former.

The incentives within the SVD seem to remain strongly biased against accurate reporting of disease outbreaks – a relict from the collectivist past when an outbreak was considered the fault of the veterinary staff at the kolkhoz or sovkhoz where it occurred and an indication of their failure to have taken effective preventive measures. This apparent preference for covering up or denying incidents of serious diseases also explains the extraordinarily long delays with which diseases are officially acknowledged even when the populace and press are already widely aware of them. Inadequate diagnostic capabilities compound the problem: a disease for which the requisite diagnostic tools are not available cannot be confirmed.

Brucellosis. Brucellosis affects both animals and people. Its principal causative agents are *Brucella abortis* bang, mainly in cattle, and *Brucella melitensis*, mainly in sheep and goats. *B. ovis* also occurs in Kyrgyzstan, but there is little information on its prevalence. There have been few studies of Brucella in yaks, horses and pigs in Kyrgyzstan, and it is unknown how large the Brucella reservoir is in wild animals.

There is considerable discrepancy between the SVD data on brucellosis in animals and the MOH statistics on human cases each year. Whereas the SVD data suggest a stable or even declining incidence, reports on human infections are increasing rapidly. Some veterinarians say that MOH overstates the number of cases by diagnosing "brucellosis" in cases of fever without laboratory diagnosis, but MOH insists that its data are based on laboratory confirmed cases. In Osh oblast, the SVD reported only 7 new cases in 2004, whereas MOH reported 17.6 human cases per 100,000 which, with a population of 1.3 million in the oblast, means about 229 new cases. There is a brucellosis task force in each oblast and its first function is information exchange, but it does not appear that these task forces work as they should.

Brucellosis in humans. Infected sheep and goats can transmit *B. melitensis* to humans, causing Malta fever. Out of 5,000 cases found in humans (with laboratory confirmation) in recent years, all but one were cases of *melitensis*. The number of human cases has increased from 1,219 in 1999 to 2,522 in 2003. The official MOH for 2002 was 37.6 cases per 100,000 people; in 2003 it had risen to 50.3 per 100,000. Considering that Kazakhstan had 13.3, Tajikistan 13.6, Uzbekistan 1.7 and Russia 0.27 cases per 100,000 in 2002, it shows the seriousness of the situation in Kyrgyzstan. In 2004, Batken recorded 78 cases per 100,000, Talas 62.4, Naryn 56.8,

¹⁴ 154 persons were surveyed, including 43 farmers, 32 private veterinarians, 26 agricultural extension agents, 35 state veterinarians, and 18 staff at Aiyl Okmotu level and others.

and Chon-Alai raion in Osh 206.2 – all confirmed by laboratory tests. It should be kept in mind that these regions have large numbers of sheep and, at the same time, below-average coverage of veterinarians and medical services, so that many sheep and people, especially rural residents, are likely to go undiagnosed. Moreover, many rural residents tend to treat themselves with antibiotics when feeling ill. It is very likely, therefore, that the official data, based on laboratory confirmation, understate the true extent of the problem in humans.¹⁵

Brucellosis in cattle. Due to the reportedly low incidence of brucellosis in cattle, the Kyrgyz control strategy is based on non-vaccination, mass testing and slaughter (without compensation). The SVD states that 80 to 100% of all cattle are serologically tested each year. If found positive, animals are to be retested and, if found positive again, slaughtered under veterinary supervision. Farms with positive cases remain under surveillance until all animals test negative during two rounds of testing. In 2004, about 889,000 cattle were tested and 2,600 were found positive. No information is available, however, on how many tested positive in the second round and how many were eventually slaughtered under veterinary supervision. Every farm selling milk is required to hold a certificate that its cattle are tested and free from brucellosis. This certificate is usually issued by the SVD veterinarian, but it is normally the private veterinarian who collects and submits the blood samples for testing and receives the laboratory results. This suggests that obtaining the brucellosis certificate is merely an administrative process that is subject to easy abuse.

The major problems faced in the effort to eradicate brucellosis in cattle are:

- *Slaughter without compensation.* Since the carcass value of a reactor cow is considerably less than that of a healthy carcass, most farmers refuse the marking or tagging of their cattle as a reactor and it is difficult for a private veterinarian to enforce it in the absence of adequate compensation payment for compulsory slaughter. Many such animals are instead sold in a livestock market elsewhere, so that the serological testing in effect promotes the spread of the disease instead of controlling it.
- *Ineffective control of animal movement.* The lack of animal identification and the ineffective veterinary inspection service make it impossible to control the movement of infected animals. With testing done by private veterinarians but certificates issued by SVD staff, the certification process is meaningless except as a means to generate unofficial revenue for SVD veterinarians who issue “rubber stamp” certificates.
- *Lack of processing capacity for reactor cattle.* The two plants that processed reactor cattle during the Soviet period are no longer operational.
- *Misinformation.* The widespread belief that brucellosis can be cured with antibiotics leads to brucellosis carriers and seropositive animals remaining in the herd.

Brucellosis in sheep and goats. The current control strategy is to test young replacement female animals and rams for brucellosis and to vaccinate all negative replacement females with vaccine S-19. Adult sheep are vaccinated annually with the same vaccine, but this approach is no longer effective. With breeding no longer controlled, there is no obvious time when sheep are not pregnant and can be vaccinated without risk of abortion. There is no capacity to take the required number of samples with the proper sampling framework in order to maintain a

¹⁵ As contact with sheep is the most common way of human infection with *melitensis*, the high rate of *melitensis* victims among the urban population is of concern, giving rise to the suspicion that infection might spread through milk from cows infected with *melitensis* or through close contact with sheep on small family farms.

meaningful disease monitoring system. Sheep no longer have permanent identification. And S-19 is no longer an effective vaccine for sheep because it provides protection for a maximum of 1 year, if it is effective at all in sheep. OIE instead recommends Rev-1, already used during Soviet times, which gives a better immune response in sheep and 2-3 year protection. The SVD argues that the decision to return to the use of S-19 was due to some cases of reversion (the vaccine made the sheep ill and could have infected people through contact), but this potential side effect of vaccinating with Rev-1 is far less serious than the impact of using the largely ineffective S-19, leading to a rapid increase in the number of human cases. The fact that the local factory is capable of producing S-19, but not Rev-1, is more likely to have determined the SVD choice of vaccine.

Some private veterinarians refuse to vaccinate sheep and goats with S-19, because they fear farmers' compensation claims in case of abortions. They dump the vaccine, return the empty bottles to the SVD and report a corresponding number of completed vaccinations. The vaccination reports compiled by the SVD therefore need to be regarded with considerable skepticism. The plan for 2004 called for vaccinating 2,273,000 sheep -- and 2,367,220 were reported as having been vaccinated. This would seem to be gross overestimation of actual vaccination coverage. In the remote areas of Naryn and Issyk-Kul there simply are not enough veterinarians to vaccinate all sheep, even if the quantity of vaccine supplied were adequate. Indeed, field surveys suggest that the actual rate of vaccinations in 2004 was only about 33%.

Foot and Mouth Disease (FMD). FMD is a highly contagious viral disease, which spreads through direct contact and wind. It appears mostly in cattle. Of all diagnosed infected animals in Kyrgyzstan, 77% were cattle, 15% sheep and 8% pigs. The disease can be sub-clinically present in small ruminants, which makes them, along with game animals, a reservoir for the disease that can only be uncovered through serological testing.

From 1966 to 2003, there were 867 registered outbreaks, with 499,517 animals confirmed as infected. There were three reported FMD epidemics during this period, the first two lasting 10 years each, the third two years. The most recent epidemic outbreak, in Batken in 2004, did not follow the "normal" pattern of past FMD outbreaks in Kyrgyzstan. Probably having entered from Tajikistan or Uzbekistan, it did not respond to ring vaccinations and continued to spread. Although outbreaks of the Asia I type in Uzbekistan and Tajikistan had been already reported by OIE, the Kyrgyz SVD first denied and then took a very long time to confirm that this outbreak was also of this new type -- for which animals in Kyrgyzstan had no protection through vaccination. Given the limited capability for monitoring, it is uncertain whether the country is currently free of FMD.

The current SVD strategic control plan for FMD, mainly dictated by the shortage of vaccine, is to vaccinate animals in the border zones to prevent the re-introduction of FMD into the country. The officially reported FMD vaccination data for 2004 are puzzling: 2,064,922 vaccinated cattle, compared with the planned number of 2,027,200. These data are not borne out by reports from the regions: Osh oblast reported only 75% vaccination coverage, for instance, and the field survey conducted for this study suggested that vaccination coverage was below 50%.

Anthrax. Anthrax usually occurs in sudden outbreaks. Its main symptom is sudden death in animals. When exposed to oxygen the anthrax bacillus forms a spore which can remain infective over 50 years. Anthrax carcasses therefore should be either burned or buried deep. Given the scarcity of firewood, the typical practice has been deep burying and fencing off the area to avoid

contamination. Unfortunately, the fences have now collapsed or been stolen, so that animals can freely enter some of these sites, leading to possible new infections.

In humans anthrax is an occupational disease. Especially at risk are workers in abattoirs, wool grading sheds, tanneries and skin stores. MOH has a vaccination program for this risk group in areas where animals are known to have died of anthrax. The vaccine is imported and expensive, so MOH is unable to cover the entire population at risk. In 2004 there were 27 human cases of anthrax in Osh alone, illustrating that it is a zoonosis which merits an active control program to protect public health and to comply with OIE rules. In the case of export of hides, skins and wool to China, also a WTO member, this would require the issuance of an international veterinary certificate.

Blackleg. Livestock keepers sending their animals to areas where Blackleg is endemic have learned the hard way that vaccination is a must. The cost of animal losses to the disease is much higher than the cost of vaccination, and vaccine availability is generally not a problem. SVD plans called the vaccination of 823,420 cattle in 2004, and 653,242 were reported to be vaccinated. The field survey suggests that vaccination coverage was about 40%.

Leptospirosis. Leptospirosis is a zoonosis causing milkers' fever in humans. It is registered in all oblasts. Serological study results showed that 4.3% of animals were infected, but regular monitoring has not taken place for a number of years due to the absence of reagents for testing. There does not seem to be reliable information on the incidence in humans. SVD reports that 63,800 cattle were vaccinated in 2004. Like brucellosis, it is a disease that cannot be controlled by vaccination and veterinarians alone, but requires an awareness of the disease by farmers and an active desire by them to eradicate it.

Sheep Pox. Although sheep pox is not on the SVD strategic list of diseases under state control, it is a "List A" disease for which the SVD is the sole authorized body to import vaccine. In 2004, there were two outbreaks in Talas, and vaccination programs for specific areas in Issyk-Kul and Naryn are ongoing. Animals are vaccinated only in areas where an outbreak has occurred, but are then supposed to be vaccinated for three years following the date of occurrence. In 2004, vaccination was planned for 1,723,700 animals and, according to SVD reports, 1,921,126 animals were vaccinated.

Newcastle Disease (NCD). Commercial poultry enterprises cannot operate without vaccinating their birds against NCD; the financial damage of a possible outbreak is many times the cost of vaccination. There is now much concern about the uncontrolled import of chicks and hatching eggs from China, which might introduce NCD or Highly Pathogenic Avian Influenza (HPAI), which is now endemic in parts of China, Thailand and Vietnam. There have been rapid developments in the field of poultry vaccines over the last number of years, but many of the new vaccines are not yet available in Kyrgyzstan.

Highly Pathogenic Avian Influenza (HPAI). HPAI poses a significant threat to Kyrgyz poultry owners and, potentially, to humans. HPAI outbreaks have recently been reported from several locations in Kazakhstan, and the risk of outbreaks in Kyrgyzstan is heightened by the fact that large numbers of migratory birds either winter or stop over at Lake Issyk-Kul, the Chui valley and in the south. A contingency plan to prevent and, if necessary, respond to any outbreaks has been prepared, but detailed implementation arrangements still need to be formulated.

Rabies. Rabies is an acute viral infection of the central nervous system. Viral transmission is usually through saliva via the bite of an infected animal, with dogs being the principal transmitter to humans. During the last few years there has been an increase of outbreaks in domestic animals. 94% of these cases were in southern regions of the country, suggesting the existence of rabies reservoirs in game animals in the south. With fewer domestic animals on high mountain pastures, predators, especially wolves, have ventured closer to the centers of population, and this has led to more frequent contact between rabid wolves and dogs and, subsequently, an increase in rabies cases in humans. Interestingly, during the last 10 years most cases of rabies were registered in the same villages and regions of the southern oblasts. Of the 87 reported human cases of rabies in recent years, 80 people contracted it through dogs, 2 by contact with cattle, 1 person was bitten by a fox, and in 4 cases the source of contamination could not be identified. Vaccination of dogs would therefore eliminate the most important source of human infection.

Echinococcus. This tapeworm is the causative agent of Hydatid disease in humans and other mammals, causing so-called hydatids: bladders of different sizes filled with worm larvae. The dog is the definitive host for this species. Dogs and other canines are parasitized by the adult tapeworm. When shed by the mature tapeworm, the proglottids disintegrate in the dog's intestine. The eggs can survive freezing and drying on the ground for up to a year. With the exception of humans, many mammals, in particular sheep and horses, may act as intermediate hosts. Sheep and horses can pick up the eggs or larvae through ingestion of grass. Humans can be infected through direct contact with dogs and by poorly observing hygiene.

Diminished regular de-worming of sheep, the frequent mixing of flocks in pastures, and the cessation of annual free provision of remedies for dogs seem to have led to an increase in the incidence of Echinococcus in humans. Even with regular dosing of dogs, only better management of slaughter offal and dead animals will reduce the re-infection of dogs and other animals such as foxes and wolves. The very high incidence of home slaughtering in Kyrgyzstan will make this difficult to achieve.

V. Elements of a New Strategy

New Needs and Requirements. The current veterinary services system, with its obsolete administrative procedures, hierarchic structure and flawed incentives, clearly can not guarantee the necessary control of animal diseases and zoonoses in the country. The knowledge base of the service needs to be upgraded to incorporate modern disease control mechanisms. Service structure, operating principles and attitudes need to be reformed to conform to the new requirements of a private and market-based livestock sector. The roles of the public and private veterinary service providers need to be clearly delineated so as to complement each other effectively and meet their clients' needs. And the policy, regulatory, monitoring and reporting framework needs to reflect the requirements of operating within the parameters of international treaties and conventions. Command and control needs to give way to service, advice and facilitation.

There are sufficient numbers of qualified veterinarians to meet today's and tomorrow's needs and to ensure animal and human health. But it will require adopting a new approach to providing veterinary services. The **public sector** needs to focus – effectively – on regulation, monitoring, border and quality control, and ensuring Kyrgyz compliance with international standards and norms. The **private sector** must be given the necessary room and support to be able to provide quality service to the livestock owners; this includes, very essentially, a policy of facilitating the

adequate availability of high-quality veterinary drugs and vaccines and, thus, an end to the current restrictive drug and vaccine procurement practices.

The national animal disease control strategies and methods will have to be revised and corrected to respond to the structural changes in the livestock production and marketing systems, to OIE and WTO membership requirements, and to global advances in diagnostic, control and treatment practices. A blanket national animal disease control plan, defined in terms of annual vaccination and testing targets, is no longer appropriate. These costly yet ineffective interventions have to give way to more appropriate methods for animal disease control in which the livestock keepers and private veterinarians play a much greater role. Rather than attempting to eliminate all risks without considering the costs, scientific risk assessment and risk management have to become the key rules of the game. The internationalization of trade requires the SVD to be increasingly aware of and in tune with developments in the outside world. It also requires a different type of veterinarian who possesses not merely solid veterinary knowledge: additional know-how and skills are needed to perform the tasks of a modern veterinary service, where effective communication and reporting are prominent requirements.

In order to formulate effective veterinary policy and legislation which responds to national needs and complies with international requirements, a thorough analysis and evaluation is needed of the current situation, including of the structure of the veterinary sector and a thorough stakeholder analysis. The core functions of the public and private sectors should be clearly defined and agreed upon. From this should follow a restructuring plan for the state veterinary services that goes beyond merely downsizing the SVD and moving staff into the pseudo-governmental private veterinarians' association. An updated risk analysis and a development plan for the veterinary services should be the basis of new veterinary legislation.

Legislative reform. A central problem faced by the Kyrgyz veterinary services is the absence of policies and legislation that define the appropriate role of the state veterinary service in a market economy and comply with the requirements of WTO, OIE and other international organizations. The veterinary law of April 2005 is largely based on those of Russia, Ukraine and Kazakhstan and not very well geared towards the future. It essentially perpetuates the traditional "command" approach and places onerous restrictions on private veterinary practice that make it very difficult to perform and to earn a living. The law falls well short of the required international standard. It fails to use the internationally current terminology that is critical where national law has to comply with international standards and regulations, and it is not in compliance with international practices and standards such as Good Practices and Hazard Analysis Critical Control Points (HACCP).¹⁶ Regarding food safety, the law prescribes the traditional approach of retroactive inspections and sanctions, while the WTO requires pro-active methods as described in the Codex Alimentarius as the guiding principles for national legislation governing food safety (including the specific terminology).

The law assigns responsibilities to the SVD that considerably exceed the typical and recommended functions of a public veterinary service and also the capacity of the SVD. Article 6, for instance, assigns to the SVD responsibility for "*organizing and implementing the veterinary-sanitary prophylactic measures on the prevention of the emergence and spread of the*

¹⁶ "Good Practices" include good agricultural practices (GAP), good hygiene practices (GHP) and good manufacturing practices (GMP) and describe the processes involved in the production processes for drugs and vaccines. HACCP is a self-control system to ensure the safety of food products.

infectious and non-infectious diseases of animals and measures on its liquidation". This is simply not feasible. A practicable law should specify the diseases for which the state veterinary service takes responsibility and how it will collaborate with the private veterinarians in such cases. The law is also not consistent with other legal provisions. Article 7 assigns to the state veterinary authorities responsibility for "*establishment of the organ implementing the control over the production and quality of the veterinary biological medical drugs and other veterinary medicinal means,*" but a parliamentary resolution has assigned to the Ministry of Health responsibility for licensing drugs, opening the door to serious confusion and conflict.

The veterinary law needs to be revised and brought in line with today's realities and requirements. This means, *inter alia*, establishing the appropriate responsibilities of the state veterinary service and of other service providers, bringing Kyrgyz requirements in line with international practices and standards, establishing laboratory and food safety management standards based on HACCP systems and international Good Practices, and providing appropriate references to the normative acts and ordinances that regulate private veterinary practice. The latter should include reference to an effective professional organization which, according to the best international practice, would be responsible for establishing and enforcing a solid code of conduct, sanctioning members in case of misconduct, and resolving disputes.

Education and communication. Control of animal diseases and protection of public health cannot be the sole responsibility of the government and the public veterinary services. Every livestock owner, milk producer and dairy- and meat processor bears responsibility, and these responsibilities should be laid down in regulations and clearly communicated to livestock keepers and food processors. Everyone in the chain must have adequate knowledge of the various animal diseases and especially of zoonoses. Since most farmers lack sufficient knowledge and understanding of the importance of animal health care practices, this requires an extensive effort to disseminate essential knowledge on symptoms, preventive measures, vaccinations, laboratory testing and legal requirements to all veterinarians and livestock keepers.

Unfortunately, the increase in animal diseases and in zoonoses and the growing number of reports of unprofessional conduct have severely tarnished the image of the veterinary services. At present, farmers do not regard the veterinary services as a reliable partner, making the task of engaging other stakeholders in productive collaboration quite difficult without first restoring respect and trust in the veterinary profession. This requires, firstly, an upgrading of skills and know-how and, secondly, consistent adherence to professional ethics and standards. Unless this is achieved, efforts to engage the other stakeholders will not succeed.

Veterinary service reform. Core tasks of a public veterinary service include policy formulation, disease monitoring, service supervision, and international reporting and liaison. For the SVD to perform these key tasks, a number of measures need to be taken:

- Preparation of a detailed plan of structural reform and operational refocusing of the SVD and other public veterinary services such as the Veterinary Militia, as well as identification of assistance requirements to develop and implement such a plan;
- Development of a workable framework for public-private collaboration in veterinary service provision and public health monitoring, with effective contracting, monitoring, reporting and supervision arrangements;

- Development and implementation of a plan for the phased elimination of superfluous positions in the public services and the simultaneous privatization of veterinary positions and veterinary practices.

Strengthening the laboratory system. To meet today's needs for effective national veterinary laboratory capacity, a national master plan is needed. It should be aimed at rationalizing laboratory capacities and establishing appropriate responsibilities and procedures for inter-laboratory links and collaboration. The plan should determine the number and location of public laboratories required, determine their respective functions and responsibilities and their links with others, determine realistic equipment, staffing, training and financing needs, and eliminate or privatize all those no longer needed or fundable. The core of the network should probably comprise three major regional laboratories, of which one would be the national reference laboratory with ISO 17025 certification. For quality cross-checking, a second laboratory with ISO certification should presumably be maintained at the Livestock, Veterinary and Pasture Research Institute. Most other lower-level laboratories, at the raion level, could be privately operated.

Institutional partnerships. With various other ministries and agencies having (or claiming) some responsibility for food safety matters, it is imperative that the SVD cooperate effectively with all of them. At present, poor coordination among these governmental bodies subjects livestock producers and processors to multiple, often inconsistent and/or overlapping, regulations, inspections and licensing requirements that cause much confusion and involve unnecessary costs. At the same time, this lack of coordination entails the risk that important issues are not covered at all by legislative or regulatory acts.

Particularly essential, and currently not very effective, is collaboration and coordination among government agencies in the area of controlling zoonoses. Although there are, for instance, Brucellosis task forces in each oblast, most stakeholders state that these do not function as intended. The wide discrepancies between MOH and SVD statistics on brucellosis and other key diseases are indicative of the poor coordination of efforts. With the new threat of HPAI looming ahead, Kyrgyzstan cannot afford to have key public safety agencies such as MOH and SVD operate in isolation from each other. Urgently needed, thus, is agreement on each agency's responsibilities and functions, on the procedures for sharing information, and on the content of the various operational manuals so that procedures, diagnostics, reporting and actions are congruent and effective.

Promotion of private veterinary practice. Making private veterinary practice the foundation of the veterinary service system will require investments in facilities and equipment, improved drug and vaccine delivery mechanisms, improvements in knowledge and skills, and an effective professional organization of private veterinarians. Veterinarians released from public service should be aided with a redundancy payment equivalent to several months' salary. In addition, they could be given an option to lease or purchase the building of the veterinary post from which to operate their new private practice. Provided they satisfy certification requirements, they should also receive a contract from the SVD for carrying out clearly stipulated public-good veterinary tasks at village level. Consideration should also be given to establishing a credit facility for private veterinarians to purchase office space, equip their practice, and procure an initial supply of drugs and vaccines. Such loans could be guaranteed by the Association of Private Veterinarians, which could also act as the "broker" for the public-private contracting.

Professional Association. The private veterinarians need a more effective and truly independent professional association that has meaningful objectives and is an effective and attractive service provider for its members. It should, for instance, assist its members in upgrading their skills and capabilities. To this end, a suitable training program, consisting of various modules, should be devised which would then be run through and by the association. The association should also render member services in administration, registration, purchasing of equipment and drugs, and representing their interests vis-a-vis the SVD and others. It should also play a role in ensuring the quality of veterinarians' work, by means of a professional self-policing mechanism. And it could be involved as intermediary and regulator in the public-private contracting scheme and participate in governmental inspections of the work of private veterinarians.

Certificates, permits, statistics and fees. At present, the compilation of statistics, the issue of permits and certificates, and the collection of fees are among the main tasks of government veterinarians. These functions can and should be carried out by private veterinarians. Certificates should be issued by the professional who monitors the health status of the animal and can assess whether it is suitable for consumption or allowed to be moved. All veterinary forms should be given to and filled in by the private veterinarians, with the obligation to provide the completed forms to the local SVD office. Fees payable would be shared in appropriate fashion between the State and the veterinarian.

Drug and import registration. The current legal requirements for vaccine and drug registration and import licensing and the associated regulatory and administrative procedures are complex, nontransparent, out of tune with both national needs and international practice, and subject to abuse. They urgently require rationalization. Authority over the registration of veterinary drugs and vaccines has been shifted from the SVD to MOH, but the licensing of traders is still under the purview of the SVD. This arrangement does not work satisfactorily, and there are frequent and serious complaints about the quality of drugs and vaccines that are available commercially. Unregistered and unlicensed drugs and vaccines are widely used, mainly because there are few legal imports due to the high costs of registration and import licensing and the non-transparent manner in which the SVD approves import applications.

The regulatory framework for drugs and vaccines needs to be modernized and simplified, and the wide scope for collecting rents through manipulation of the system must be drastically curtailed. The list of registered veterinary drugs should be made public, and the association of private veterinarians should be enlisted to help prevent the use of unregistered or unlicensed drugs. Imports of registered drugs and vaccines should be exempt from import licensing requirements. Drug and vaccine procurement by the SVD for public-good disease control programs must not be determined by domestic availability, but by clinical determinants of effectiveness. All veterinary drug outlets should comply with minimum standards concerning cold storage facilities and training of personnel. These "vet-apotekas" that now exist in most towns and major villages, where veterinarians and farmers can buy drugs across the counter, have a very important role in ensuring the correct application of drugs, and in many instances they are in fact making a diagnosis based on the symptoms described by the animal owner and prescribe what they consider to be the appropriate drugs.

Private sector cost sharing. Survey findings and field interviews show that the private sector is prepared to contribute far more towards animal health care than the state currently allows. Considering the value of animals and the cost of vaccines, there is no reason why livestock owners should not be made responsible for more vaccinations at their own expense – provided

the timely and adequate supply of the right vaccine can be assured. Animal owners themselves confirm this. Those interviewed also emphasize that they demand and expect an end to corruption, poor performance, and the absence of adequate quality control on the side of the state.

Human health and food safety. Most of the current food safety problems in the farming communities are directly related to zoonoses: Brucellosis and Echinococcus. Key factors in controlling these diseases are awareness raising and simple management measures to be applied by the farmers themselves: extreme care at the time of lambing and calving, boiling milk before consumption and in-house processing, and treatment of dogs against Echinococcus with the required frequency. Fortunately, an effective implementation mechanism is already in place in two oblasts, Naryn and Talas. Established in response to increasing infections with Brucellosis, MOH trains voluntary village health committees to hold village meetings and undertake door-to-door information campaigns. The program is managed by Kyrgyz-Swiss Health Reform Support Project and has proven to be very effective. Plans exist to expand it to the other oblasts, with funding from USAID and SIDA, and this should be implemented as a high-priority activity.

These village health committees can provide the essential link for the veterinary services to reach large numbers of farmers and their family members. In addition to their current focus on Brucellosis, the committees could similarly become active in promoting the control and prevention of other zoonoses such as Echinococcus, Rabies, Trichinosis and, potentially, HPAI. These committees can also provide the essential tool of social control to make sure that positively identified animals are slaughtered and disposed of in a safe manner. This will require assistance with training, development and printing of information materials, and funding to purchase required materials (gloves, anti-echinococcus drugs, bullets to control rabid and stray dogs, foxes and wolves, etc). The construction of simple slaughtering slabs can enable village health committees and private veterinarians to issue joint permits for meat sales.

Brucellosis control. All of the actions recommended above could be structured around one central operating theme – such as a nationwide brucellosis control program. This would provide clear targets and scope for impact assessment. With brucellosis control having been designated as one of Kyrgyzstan's Millennium Development Goals in the health sector, this also makes it a high-priority activity.

The essential aspects of the Brucellosis Control Strategy formulated in 2002/03 still hold true and should form the basis of the national brucellosis control program. The main thrusts of this strategy are:

- With cattle, continue the policy of testing and slaughter due to the relatively low (confirmed) incidence. The cross-infection of cattle with *B. melitensis* should be studied. Instead of fining farmers who own infected animals, a compensation mechanism should be elaborated and implemented.
- For sheep, initiate a whole-flock vaccination campaign with Rev-1, the internationally recommended method for the control/eradication of *B. melitensis*. Stop the use of S-19 in small ruminants, since the risk of reversion with REV-1 is smaller than that of the non-effective S19 vaccine. The current state of the diagnostic laboratories does not allow for control programs that are dependent on extensive laboratory testing. A whole-flock vaccination campaign will reduce the workload for the laboratories and provide time for a rationalization of the national veterinary diagnostic capacity. To increase farmer

incentives to vaccinate, vaccines and vaccination services should be provided free of charge.

The FAO program in Tajikistan has proven that the incidence of brucellosis can be reduced drastically with REV-1 blanket vaccinations. The research work and implementation of a new brucellosis control strategy in Mongolia, with FAO and Swiss support, have demonstrated that it is possible to develop and maintain such a program with national budget resources, because it generates enormous savings on treatment of people and lost productivity of both humans and animals.

The Kyrgyz National Program for the Control of Brucellosis is supposed to be managed by the SES in MoH, in close collaboration with the SVD. While MOH is emphasizing the work of the village health committees, the SVD is still doing little else but continuing its ineffective vaccinations with S-19, supplied by Altyn-Tamir. The seriousness of the situation necessitates a more effective approach. Any brucellosis control program must tackle the disease in both humans and animals. To control brucellosis in humans, training and awareness raising on avoiding contamination and infection are of overriding importance. To control it in animals, it is important that the veterinary program is matched by an extension and training program to help farmers understand the disease and take all necessary management measures to control animal-to-animal and animal-to-human transmission.

A recent proposal by the public health and epidemiology department of the Swiss Tropical Institute (STI) holds the best promise for developing a workable model for control, in which the health service, the veterinary services, a research institute and the farmers are all involved to implement an active control strategy. STI has already done a study in Mongolia to calculate the benefits of a brucellosis control vaccination program and to devise a formula for sharing the costs among the beneficiaries: farmers, Ministry of Health, and Ministry of Agriculture. When the program was implemented, the decline in human cases exceeded the predictions of the model.

The proposal involves a 1.5 year study in one raion in Naryn, in close collaboration with the Livestock, Veterinary and Pasture Research Institute, in which the veterinary and human health aspects would both be considered. The study would establish the key parameters needed for a similar cost-benefit calculation for Kyrgyzstan and the design of a cost-effective country-wide strategy and operational plan for the control of brucellosis, together with likely financial and economic benefits. Its outcome could also be used to help generate a regional consensus on how to control brucellosis, an important point in view of the substantial legal and illegal border trade in animals.

Proposals to experiment with RB51 vaccine, developed at Colorado State University, do not look very useful for now. The vaccine works in cattle, but its effectiveness in small ruminants has not been demonstrated. RB51 is a marker vaccine, which in laboratory diagnostics will show a difference between vaccinated and infected animals, but to do this in Kyrgyzstan would require considerable investments in laboratory capacity. Moreover, since brucellosis in Kyrgyzstan is a much larger problem in small ruminants than in cattle, such a program would not contribute much towards alleviating the problem.

Chapter 5

Pasture Use and Management

I. Resource Importance

Abundant pastures represent one of the most important natural resources in the Kyrgyz Republic, and future agricultural development and rural incomes will depend heavily on the efficient use of this ample, but nonetheless limited, natural resource to produce low-cost quality animal products for both domestic and export markets. The associated landscapes also contain, in addition to their scenic beauty, a vast array of plant and wildlife biodiversity, and environmentally sustainable pasture management is thus rightly viewed as essential for the development of a potentially valuable tourist industry.

Traditionally, the pastures were used in a transhumant system, with summer grazing at the higher altitudes and winter grazing on winter pastures in the valleys. In spring and autumn, animals grazed on middle-altitude pastures. This system was replaced by collectivism during the Soviet period, and extensive winter feeding with largely imported feed allowed much larger numbers of animals to be maintained in the country than previously or at present. Current animal numbers are probably considerably below the actual carrying capacity of the country's pastures, provided they are used efficiently and sustainably. However, the present arrangements for pasture use allocation and pasture management are not conducive to optimal resource use. The traditional practice of moving animals to summer pastures is no longer widely followed, with the result that summer pastures are under-utilized and spring/autumn and winter pastures are severely overgrazed. This is a major cause of poor animal performance and serious environmental damage.

Table 16: Average Pasture Dry Matter Production (kg/ha) since 1948

Observation Period	Average yields for the Republic	Type of Pasture including		
		Spring-Autumn	Summer	Winter
1948 – 1955	285	270	335	170
1969 – 1978	260	225	330	160
1980 – 1985	215	195	285	115
1986 – 1994	220	210	275	135
1997 – 2004	210	170	275	85

Source: Giprozem

Table 16 illustrates the long-term decline in pasture productivity, with winter pastures showing the most serious reduction and summer pastures the least. Much of the post-Soviet decline is due to mismanagement, with the failure to encourage movement of animals to summer pastures being a major factor. Correcting this problem will require a multifaceted approach, but one centered on a major shift in responsibility from central to local authorities.

This Chapter discusses primarily the institutional factors which are considered the most essential constraints to improving and sustaining pasture productivity. Other important issues include improved access to, and water supply at, more distant pastures, and improved knowledge of farmers regarding grazing techniques, but they are considered to be of secondary importance. There also are more technical aspects which are not covered here, such as reseeding, weed control, fencing and fertilisation, all of which may be locally relevant once the basic constraint is resolved.

A. The Challenge of Effective Pasture Management

With forage availability strongly affected by altitude, transhumance represents the most efficient and sustainable use of pasture resources:

- animals graze at the high altitudes in summer when pastures there are productive,
- they then move to lower altitude pastures in autumn,
- they are brought down to the valleys for the winter, where they rely on a mixture of winter pasture, conserved hay and crop by-products, and their own body fat built up during the summer to get through the winter
- they move back up to low-altitude pastures in spring as pasture vegetation becomes available, and then further up again to the high-altitude pastures during the summer.

In Kyrgyzstan today, this cycle is largely broken. The close-in winter pastures are used year-round, causing significant overuse and degradation and leaving no time for recovery. The distant summer pastures, by contrast, are underused and increasingly subject to degradation through the spread of unpalatable plant species. The causes for this unsustainable use pattern include (i) the widely dispersed livestock ownership with many owners of just a few animals, (ii) an as yet poorly developed practice of entrusting animals for summer grazing to professional shepherds, and (iii) the fragmented administrative arrangements for allocating pasture use and managing pastures. Of these, the latter is the most critical and the one that needs to be addressed first. Unless pasture use is again aligned with the seasonality of vegetation growth and recovery, all other measures proposed from time to time to improve pasture productivity are essentially fruitless.

B. Characteristics of Kyrgyz Pasture Resources

Pastures account for over 86 percent of Kyrgyzstan's agricultural land and cover 89,000 km² (see Table 17). In addition to designated rangeland, there are pastures that are classified as part of the 'Forestry Fund'; the area of this Fund is 32,000 km², of which 21,300 km² have no forest cover and are effectively pastures.

Table 17: Agricultural Land in the Kyrgyz Republic (hectares)

Land Use	Area (ha)	Percentage of Total Agricultural Land Area
Pastures	9,187,600	86.2
Arable land	1,238,600	11.6
Hay land	169,600	1.6
Perennials	37,400	0.4
Fallow land	21,400	0.2
Total	10,654,600	100.0

Source: Resolution # 744 of the Government of the Kyrgyz Republic on Distribution of Land Fund according to the Agricultural Land Categories as of January 1, 2004 (October 7, 2004).

According to their seasonal use, pastures are divided into three major categories: winter, spring-autumn and summer pastures (Table 18).

- *Winter pastures*, occupying 2,063,000 ha, generally close to permanent settlements, in areas of light or negligible snowfall where livestock can be easily housed, at least at night. Usually livestock sheds are located at these sites, as are small houses for shepherds. In many localities, these pastures are grazed all year and, consequently, in especially poor condition.
- *Summer pastures*, occupying 4,129,000 ha, usually situated at middle elevations and in the high mountain valleys and gorges, typically located at significant distances from the settlements. They are characterized by high productivity and are used in the summer from one to four months. Excessively used in Soviet times, most summer pastures are now showing the beneficial effects of several years of light and sometimes negligible grazing by livestock – but many also show signs of degradation through the unchecked spread of unpalatable plant species.
- *Spring-Autumn pastures*, occupying about 2,955,000 ha, usually located in the foot hills below 2,500 m altitude. Grazing starts here in the early spring when forage growth begins and again in fall after the harvest has been taken from the fields. These pastures are extremely important because they serve as the first natural feeding source after winter, and they are used for inseminating, shearing and dipping of sheep.

Table 18: Seasonal Pasture Resources in the Kyrgyz Republic

Type of Pasture	Hectares	% of Total	Extent of degradation (%) in 1985	Extent of degradation (%) in 2002
Summer pastures	4,129,000	45	35	29
Spring-Autumn pastures	2,955,000	32	16	26
Winter pastures	2,063,000	23	12	16
Total Pastures	9,147,000	100	24	25

Source: Gosregister, Giprozem

At present, the overgrazing near populated areas and the virtual abandonment of distant pastures represent the two extremes of undesirable trends in pasture evolution. Pasture degradation increased significantly for both winter and spring-autumn pastures between 1985 and 2002. In interviews conducted in five villages in different parts of the country, over three quarters of the 370 respondents stated that pasture conditions have deteriorated greatly during the recent past. Fortunately, this degradation can be reversed through appropriately adjusted management. Moreover, expert reviews suggest that the degradation, while severe in many locations, may not be as generally serious and widespread as is believed, except where baregrazing has led to weakened subsurface root structure, and, hence soil erosion.¹⁷

Improved pasture management normally involves a winter rest from grazing, delaying spring grazing, and the use of rotational grazing thereafter. It can restore the productive capacity of the pastures. Pasture improvement can also be achieved through irrigation, reseeding and fertilizer use, applied separately or in combination. However, these technical solutions will have little, if any, lasting effect unless effective rotational management is put in place. In any case, when sufficiently effective, improved management practices offer the cheapest and most sustainable solution.

¹⁷ There are 396,600 ha of rangeland on slopes of 40° or more, which degrade very easily under cattle grazing when terraced paths, generally running perpendicular to the slope, are formed and landslides follow.

II. Past and Current Pasture Management Practices

Pasture management on the territory of the Kyrgyz Republic has undergone three distinct phases:

- (1) Traditional mixed herding and rotational pasture use patterns of the Kyrgyz prior to collectivization during the Soviet era;
- (2) Centrally planned use of pastures and intensive industrial-style livestock production during the Soviet period; and
- (3) Post-independence mixture of various livestock ownership patterns, overlapping regulatory and administrative responsibilities among different government levels and entities, and varying pasture use practices brought about by both intended and unintended changes in the rural sector.

It is important to understand the traditional way of managing and using pasture resources, because its major features remain important and have re-emerged in recent years. Positive elements of traditional pasture management that remain or are coming into use again should be emphasized and supported, and others, particularly decentralized decision-making, that remain suppressed should be revived. It is equally important to recognize the legacies and experiences of the Soviet era, because they continue to influence current and future efforts to develop pasture-based livestock management. The most relevant characteristics of these stages and their evolution are reviewed below.

A. Pre-Soviet Pasture Management – Sustainable, but Low Output

Kyrgyz livestock owners have historically engaged in pastoral transhumance, taking advantage of the different types of pastures that are suitable for grazing at different times of the year and hence naturally support pastoral herding. In the past, herders would spend winters in encampments in lower areas with no snow cover, then move with their animals to spring/fall pastures at medium altitudes, and eventually further up to summer pastures, returning again in the fall via spring/fall pastures to their valley camps.

The long history of this transhumant practice is the best evidence of herder knowledge and skills of pasture and livestock management. Considering that grazed herbage was the sole dietary source of their animals, the herders obviously were very knowledgeable in the selection of grazing locations relative to soil, vegetation, water and altitude for the different climatic zones, as also about the seasonal influences of temperature, rainfall and vegetation growth patterns. These herders also fully appreciated the preferential grazing preferences and patterns of their different animal types, which are essential to secure a balanced, efficient and sustainable exploitation of the available pasture resources.

This pattern stood the test of time at the particular level of animal performance and social requirements for that period in history. Its key features were: an absence of individual rights to pasture land; highly decentralized decision-making about grazing rights to pastures, especially for spring/autumn and summer pastures; lack of codification of use regimes; limited competition for pasture land; and no apparent overgrazing. It enjoyed broad-based social acceptance and was environmentally sustainable.

B. Soviet-Era Pasture Management – High Output, but Unsustainable

During the 1920s and 1930s, these livestock ownership and pasture use patterns were changed dramatically through the creation of large-scale collective or state farms which were transformed into even larger units in the 1950s and 1960s. The members of these farms no longer performed a broad range of activities linked to livestock and/or household management, but were assigned discrete functions (e.g., dairy maid or tractor driver) and performed the related tasks according to instructions received from a small number of specialists. This collective farming period covered two working generations in the agricultural history of the Kyrgyz Republic. This resulted in the loss of animal and pasture management skills for the majority, as only a few were directly involved in this work within the collectives.

Compounding this loss of experience is the fact that livestock production practices markedly evolved during this period. Extensive sheep herding was organized, based on traditional transhumant grazing practices, but with the objective of rapidly increasing the number of animals. Since this was not possible merely on the basis of the available pasture resources, even with advanced scientific monitoring and pasture improvement techniques, the state provided substantial additional inputs that facilitated increasing herd and flock size. This included the cultivation of fodder crops and substantial imports of feed and fodder for the winter (up to 1.6 million tons annually). In addition, shelters were built to house livestock in winter, and improved transportation and social services were provided to herders in more distant locations. Rural infrastructure development in the form of railways, roads and bridges was extensive, facilitating the movement of herds among pastures. Efforts were also made to sustain lowland pastures (fencing and fertilizing) and the higher altitude ranges (aerial surface seeding and fertilization).

These practices rapidly led to intensive use of all pastures. With better transportation, central planning, and incentives to travel with the animals, herds and their attendants were moved much greater distances to take advantage of relatively abundant summer pastures in the mountains. By the early 1960s, permanent over-stocking had become the norm at almost all locations in the seasonal grazing cycle, exceeding the natural carrying capacity of the mountain pastures by between two and two-and-a-half times during the grazing season and in many instances causing pasture degradation.

Key features of the pasture management practices in the Soviet period were:

- All land was owned by the state. While some aspects of transhumant herding were retained, state control over pastures meant that the essential traditions and ways of communal grazing were destroyed.
- Decisions about use rights to different pastures were nominally made by rural councils (*sel'skie sovety*), but since livestock production was the responsibility of collective farms, it was their management which in fact made all decisions, based on detailed parameters provided by central state agencies.
- Centralized mapping, measurement and monitoring of pasture quality and carrying capacity by the State Land Management Committee (Giprozem) ensured relatively balanced but extremely intensive use.
- The objective of maximizing livestock production overshadowed that of sustainable use of pasture resources, and supplemental winter feeding was not an adequate tool to prevent overgrazing and pasture degradation.

C. Current Practice – Low Output, and Unsustainable

Fundamental among the post-Independence reforms was the dismantling of the state and collective farms. By 2001 the majority of them were re-organized and more than 85,000 private peasant farms created. Although this transformation took time and was marked by inconsistency in implementation, the impact of the change in farm structure on the national livestock herd size and on pasture management was both rapid and profound. Livestock numbers dropped dramatically, especially for sheep which declined from 9 million to 3 million head between 1990 and 1996, because the dispersal of sheep ownership to kolkhoz members left many of the new owners without the know-how and resources to sustain the animals. As the state and collective farms disappeared, their responsibilities either disappeared with them or were transferred in a series of ad-hoc decisions to other existing or newly created public institutions, eventually including also the local governments. These developments have not been conducive to effective pasture management, as today responsibility for pasture management is dispersed among various actors at the central, oblast, raion and aiyl okmotu levels.

Under these circumstances, managed pasture use rapidly disappeared. With different institutions responsible for allocating use rights to different pastures, kolkhozes no longer organizing the seasonal transport of animals to distant pastures, and herd ownership scattered among numerous small farmers, most individual farmers' are today overusing pastures close to their homes and eschewing travel to more distant pastures where infrastructure and other facilities have become derelict or non-existent. Only large flocks/herds are now taken to distant pastures for summer grazing, and most small livestock owners do not take part.

This management pattern, persisting to the present, has created a new unbalanced use. It is characterized by heavy overgrazing of low and medium altitude pastures during spring, summer and fall and suboptimal use of distant summer pastures. This use pattern also limits the production of winter fodder, because milking cows and young calves, retained close to home, require a sizeable proportion of the already bare-grazed close-in pastures, thereby reducing the area available for the production of winter fodder.

Comparisons of Giprozem data for the mid to late 1980s and for the 1997-2001 period suggest that the productivity of summer pastures has increased, while herbage production on spring/autumn and winter pastures has declined. Field examination in Talas, Issyk-Kul and Chui oblasts showed that this decline in forage production on spring/autumn and winter pastures has continued under the current management regime, while summer pastures have increased herbage production, some by more than 20%. These improvements in summer pasture productivity are encouraging, as they indicate considerable potential for improved pasture productivity under more suitable management arrangements than those currently prevailing.

III. Need for Reform

In contrast to sweeping reforms concerning the ownership and use of arable land, pasture management has not yet been a front-page issue in agricultural policy. The current institutional and policy framework reflects incomplete and ad hoc arrangements for dealing with changing circumstances. Regulatory authority is diffused among various government units. Current pasture management practices represent in some ways a return to the pre-collectivization era, but without the positive elements of relatively small numbers of livestock, and at the same time

retain many vestiges of Soviet-era regulations that are largely ignored. In fact, the current system operates parallel to, rather than in accordance with, the law (see Text Box 1).

Box 2: Roles and Responsibilities of Various Government Entities Concerning Different Pasture Types

Oblast State Administrations are responsible for:

- Drafting and securing corresponding council approval for comprehensive plans for the redistribution, use, and protection of distant pastures;
- Organizing competitions and issuing resolutions on leasing pasture land from distant pastures;
- Confirming the overall boundaries of intensive use pastures.

Raion State Administrations are responsible for:

- Drafting and securing corresponding council approval for comprehensive plans for the redistribution, use, and protection of intensive use pastures;
- Organizing competitions and issuing resolutions on leasing pasture land from intensive use pastures;
- Confirming the overall boundaries of pastures near villages.

Aiyl Okmotus are responsible for:

- Drafting and securing corresponding council approval for comprehensive plans for the redistribution, use, and protection of pastures near villages;
- Organizing competitions and issuing resolutions on leasing pasture land from pastures near villages;
- Regulating the use of pastures near villages which is not competitively leased out.

Gosregister is responsible for:

- Registering the overall boundaries of pastures;
- Participating in the development of comprehensive plans compiled by oblast state administrations, raion state administrations, and aiyl okmotus (though the latter explicitly must pay Gosregister);
- Surveying and preparation of all individual parcels of pasture land to be leased prior to announcement of competitions to lease;
- Registration of leases.

The State Agency for Environment and Forestry participates in planning and allocation of pastures which are designated as forest areas.

The Land Code is the primary document regulating land management, but it contains few provisions concerning pastures; it does stipulate, however, that pastures are state property. A number of other laws tangentially concern pasture management and use -- including the Forestry Code which regulates the use of land located in the State Forestry Fund, the Tax Code, and the Law on Management of Agricultural Land. There are many discrepancies among these various laws which cause ambiguity and misinterpretation. There are no effective arrangements in place on the control and monitoring of allocation, quality, use, or improvement of pasture areas.

The lack of a comprehensive and internally coherent policy for pastures and of an appropriate administrative arrangement to implement this policy and manage pastures is a major problem. It is compounded by the breakdown of the support network and facilities previously managed by the collective farms for summer pastures and by the much weakened capacity of state structures to enforce allocation and use patterns. Coupled with the widely dispersed livestock ownership among thousands of smallholders, these factors have combined to bring about a latent crisis in pasture management. Any major increase in livestock numbers will intensify the problem by further increasing the pressure on the already stressed close-in pastures.

A. Inconsistent and Impractical Current Arrangements

The primary legislation governing the institutional framework and procedures for managing pastures are the ‘Regulations on the Procedure for Providing Pastures for Lease and Use’ (Government Resolution No. 360 of 4 June 2002 and amended on 27 September 2004 (hereafter ‘Regulations’). They contain: definitions of the types of pastures, roles and requirements placed upon various government entities in relation to different types of pastures; principles and restrictions for the use of pastures; and detailed procedures for awarding leases of pasture land.

The current system of classifying pastures reflects location and distance from settlements.¹⁸

- Pastures located near villages; these include lands that have been cultivated, hayfields, orchards, and forests (*priselnye*);
- Pastures under intensive use – pastures which are between distant pastures and pastures near villages (*intensivnye*);
- Distant pastures used for transhumant livestock production (*otgonnye*).

This classification often leads to confusion among policy makers as well as users and, as a result, also causes many uncertainties and disputes between individuals and various management bodies. Very few farmers know the difference between these categories of pastures, and many, especially in the South and in remote areas, do not even know that there are three categories with different management rules for each. Even aiyl okmotu land management staff often have difficulty identifying where the near-village pastures end and the intensive pastures begin.

Pasture use is based on leases, and the Regulations devote much space to defining the competitive leasing process, which is mandatory – and very complicated (see Text Box 2). While the provisions are well-intentioned concerning rational use and competitive allocation, they are impractical to implement. It is difficult to imagine getting all the members of the competition commission together to decide on every parcel to be leased. The degree of detail for each pasture parcel required in the comprehensive plan also appears onerous. It is implausible that it could be done without substantial involvement by Giprozem, but funds to pay for its services are generally lacking in local government budgets. The process for documenting a herder’s right to a parcel is confusing and onerous. It is not evident why three separate documents are required to confirm the allocation of pasture use (lease agreement, transfer act, and confirming certificate), especially since all three documents are generated by the same agency – Gosregister.

¹⁸ Pastures can also be within the Forestry Fund, but can be used for animal grazing. (e.g., Forest and Non-Forest Pastures). Furthermore, there are at least three other ways in which pastures are considered in law and practice, depending on specific features: Natural and Artificial (the latter are pastures which undergo some improvements through cultivation and are used occasionally for grazing); Irrigated or Non-Irrigated (depending on the manner of water supply and whether there has been human intervention); Mountainous and Non-Mountainous.

Box 3: Procedures for Pasture Leasing

Leases are to be provided for 5 to 10 years for grazing and for up to 5 years for other uses. The process begins with an application from a physical person or legal entity to the responsible administrative entity: oblast administration for remoter pastures, raion administration for intensive pastures, and aiyl okmotu for close-in pastures. This entity forwards the application to the State Agency for Registration of Rights to Immovable Property ('Gosregister'), which in turn surveys and prepares the parcel for the competition by producing a cadastral plan, reviewing pasture stocking norms and determining the size of rent payments. A competition commission is formed with representatives of Gosregister, MAWRPI, Ministry of Finance, Ministry of Ecology and Emergency Situations, the Veterinary Department, as well as representatives from the councils and executive bodies of the oblast, raion or aiyl okmotu. Following the auction, Gosregister drafts a transfer act for the pasture parcel and the lease agreement. Subsequently, the lessee is given a further permit (confirmation certificate) for the temporary use of pasture land. This certificate must be registered with Gosregister.

A new player has recently been added with the creation in 2004 of the Department of Pastures under MAWRPI. Its terms of reference are not clear, but it appears to be charged with defining state policy regarding pasture use and management. If this Department is to take the lead in setting overall policy on pastures, it will need to establish strong links with other agencies such as Gosregister/Giprozem, the State Agency for Environment and Forests, and local governments. The provision of public services – be they administrative or technical -- should take place within a coherent overall framework, based on a clear strategy with identified priorities and resources adequate for the task.

B. Disincentives to Sustainable Pasture Use

Pasture management in practice differs greatly from the Regulations. Actual practice depends on the capacity and motivation of individual aiyl okmotu, raion and oblast administrations, local traditions and social norms, and the awareness of farmers of the required procedures. The considerable discrepancy between legislation and actual practice creates room for administrative interpretation and manipulation and provides a poor basis for the resolution of disputes.

No aiyl okmotu, raion or oblast administration satisfies the Regulations' requirement calling for comprehensive pasture management plans.¹⁹ Since aiyl okmotus lack basic information about the pastures they manage -- such as borders, location of infrastructure and carrying capacity -- to be able to draw up meaningful management plans, planning at this level is limited to projecting likely income from pasture lease fees. Maps used (if they are available at all) in rural municipalities and state administrations at the raion and oblast levels are often very old and outdated. This lack of crucial information leads to a kind of "blind" pasture allocation and cannot provide the basis for sustainable pasture use.²⁰

The problems faced by livestock owners and their views on resolving them are remarkably similar across the country. Most of these problems have the effect of undermining the incentives for moving animals over the seasons from close-in pastures to intensive and remote locations.

¹⁹ Except for one case (Orgochor municipality in Issyk-Kul oblast) where there was substantial donor support.

²⁰ Efforts to conduct comprehensive planning were noted only in donor-funded pilots. One methodology was tested in pilots conducted by the Pasture Monitoring Department of *Giprozem* and funded by the World Bank during 2000-01, and another was conducted by the Central Asia Transboundary Biodiversity Project funded by GEF and administered by the World Bank.

Those wishing to use remote pastures are confronted by numerous of obstacles, which include: i) lack of understanding which pastures are of what category and what agency is allocating them; ii) lack of information on procedures for leasing intensive and remote pastures; iii) slow processing of applications and fear of bureaucracy; iv) unwillingness to pay fees for allocation and registration which are considered too high; and v) lack of trust among villagers regarding fair allocation by raion and oblast administrations.

The terms and arrangements of lease payment are widely perceived as adding greatly to the overall confusion. A farmer taking animals to intensive and then to remote pastures has to pay lease fees three times, to three different entities, while those who graze animals exclusively on close-in pastures pay only once to the aiyl okmotu. Furthermore, the payment process is much simpler at the aiyl okmotu, while payment for intensive and/or remote pastures has to be made directly to the relevant state administration and a separate land tax payment has to be bank-wired to the tax inspectorate.

Finally, because of diffused responsibilities on land management, lack of information on land rights, growing demand for pasture resources, and, in particular, differences between communal and individual-based patterns of pastures use, conflicts are emerging related to allocation and use of pasture resources.²¹ As livestock numbers increase, some owners are assembling sizeable herds, and transhumant grazing traditions are revived, there is a growing risk of conflicts over access to pastures.

C. Lack of Transparency

Formal rents from pastures are insignificant as revenue sources at ant level of government. This suggests that changes in management arrangements will be institutionally easy. There are very few formal leases, and even in these cases payment is very often in-kind or else in cash that is kept out of the formal collection system and not recorded as budgetary revenue. Likewise, targets for pasture lease revenues are very small. Because these revenues are so insignificant, oblast administrations routinely delegate the collection to the raions, and in many cases the raions shift this task down to the aiyl okmotus.

The Regulations unequivocally state that pasture users must make payment, which consists of the land tax and the lease payments. 90 percent of the lease payment is supposed to go to the budget of the administration that awarded the lease, and 10 percent to Gosregister to cover surveying costs.²² The current (low) land tax rates have remained unchanged for the past 6 years, but lease payments, while also insignificant, are allowed to vary by region. In reality, there is only a loose connection between lease payment and the pasture area used, since the payment is usually based on the number of animals grazed. At the aiyl okmotu level, shepherds report the number of animals they take for grazing and pay a fixed sum per animal. The aiyl okmotu then divides this number by carrying capacity norms or simply records a theoretical area rented.

²¹ “Communal use” is a practice based on informal allocation of grazing rights to shepherds who graze animals on behalf of a number of households. “Private use” usually involves very few herders who usually have more than 10 cows and/or more than 100 sheep. The procedures for allocating pastures to the latter groups follow the Regulations more closely, with a specific area allocated, some map or sketch drawn, and a formal agreement signed. In such cases, individual farmers tend to formalize their agreement with the aiyl okmotu and even register it with Gosregister.

²² Revenue sharing is different for pastures overseen by the State Agency for Environmental Protection and Forestry: 25% goes to the administration awarding the lease, 70% to the Agency, and 5% to Gosregister.

There are very few formal and registered lease contracts, and views differ widely regarding their usefulness. Field surveys carried out for this study found no single case where shepherds of ‘communal’ animals formally rented a pasture plot for communal herds. Intensive and remote pastures are often used without any formal agreements, though payments are often made on the spot to representatives of the raion or oblast administration; this also tends to result in such payments not being recorded. Indeed, local state administrations have an incentive to avoid formal and registered contracts that show what revenue they should be collecting. Interviewed officials estimate that no more than 30 percent of leases are registered. According to official data on registered pasture leases, only 11% percent of total pasture land is rented out (see Table 19). Although close-in pastures are very intensively used year-round, these official data imply that only 14 percent of these close-in pastures are rented out.

Table 19: Registered Use of Pastures in the Kyrgyz Republic, 2003-2004

	Total		Near village		Intensive		Remote	
	2003	2004	2003	2004	2003	2004	2003	2004
Share of pastures leased	7%	11%	4%	14%	10%	14%	7%	6%
Rent fees collected (million Som)	4.8	7.7	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Source: Gosregister.

A Resolution of the Issyk-Kul Oblast Administration of August 2004 is revealing. It confirms the widespread disregard of the Regulations, the avoidance of formal leases, the heavy use of pastures, the inability of oblast administrations to manage affairs, and the widespread violation of legislation as higher-level administrations simply usurp revenues that should go to lower levels, including aiyl okmotus.

“The lease agreements were made for only 72,183 hectares out of 325,101 ha of near village pastures, which represents only 22 percent. At the same time all near village pastures are being used fully. Based on agreements the local budget received only 456,100 soms instead of 1,359,100 soms which were supposed to be received. If all agreements were legalized, then the local budget would receive additional 903,000 soms. Out of 336,820 hectares of intensive pastures, the agreements were legalized only for 22,878 hectares, or for only 6.8 percent of area. If the agreements were legalized, then raion administrations would receive additional 5,677,018 soms. In Jety Oguz raion, for example, legalized agreements were made only for 0.3 % of the raion’s intensive pasture area. As a result of agreements reached for rent of remote pastures, only 71,100 soms were collected instead of 1,698,000 soms which makes only 4 percent.”

The total amounts that are to be paid are very small. The aggregate of 7.7 million soms shown in Table 19 represents merely 0.2% of total subnational budgetary revenues. Even if one assumes that the in-kind, off-budget, ‘unofficial’ or otherwise unrecorded payments are four times as much, the total is still immaterial in the context of overall public finances. Furthermore, what little is received is not used transparently. It is evident that the funds collected are very rarely used for pasture improvements or rehabilitation of pasture infrastructure. It is noteworthy, then, that 67 percent of those interviewed are willing to pay higher pasture fees if they could be sure these are used for pasture improvements. An additional 15 percent of those interviewed would not pay higher fees, but only because they do not trust the aiyl okmotus and/or raion and oblast administrations with the use of such funds.

IV. Agenda for Action

Consolidation of management authority in Aiyel Okmotus. The division of pasture land among three tiers of administration fragments what should be an integrated process for assigning the use of what needs to be regarded as a single and indivisible natural resource. This fragmentation of administrative responsibility makes it very difficult to ensure sustainable use. The appropriate management approach is one that ensures an integrated use of all pastures and their seasonal use in accordance with vegetative growth and rest patterns. Such a management system can now be introduced because of the lower livestock numbers which allow rotational use and, thus, periodic resting of each pasture area.

At the same time, with pasture resources being the primary input into livestock production, effective pasture management requires that the livestock owners as the main resource users must bear primary responsibility. Management responsibility for all types of pastures (close-in, intensive, and remote) should therefore be assigned to the aiyl okmotus. The raion and oblast administrations are too distant from most livestock owners and pasture users to be responsive managers of pasture land, while the aiyl okmotus, as elected local self-governments, are more likely to be responsive to the local population. 83 percent of those interviewed in field surveys thought that aiyl okmotus should manage all pasture resources because they are close to the people, accountable to them, and can manage the allocation and management of pastures in a socially acceptable way.

Since the boundaries of rural municipalities generally coincide with the boundaries of the former kolkhozes and sovkhozes, the Soviet-era pasture allocations to kolkhozes and sovkhozes can in all likelihood be easily transferred to the respective rural municipalities that have succeeded them. With these boundaries still very well known in the rural areas, this transfer is likely considered reasonable by most stakeholders. Furthermore, as field visits have shown, many aiyl okmotus are in fact already assigning use rights for all three categories of pastures and to some extent monitor their use and collect payments from the users. The case for consolidating pasture management authority at the aiyl okmotus is also justified by the principle of subsidiarity, according to which decisions should be made at the lowest feasible level of government.

Flexibility to Facilitate Locally Appropriate Solutions. Municipalities will need wide-ranging authority regarding pasture management, since there are major differences across jurisdictions. In part these differences relate to terrain and numbers of animals: in some areas, winter pastures in effect can be used all year, while in others, particularly in the south, there is already too much pressure on pasture land. Rural municipalities will need flexibility in order to regularize local particularities of traditional communal methods of pasture use. Where social capital is strong there may be effective delegation by the aiyl okmotus to community-based organizations (CBOs), but elsewhere the legal authority of government to regulate behavior will be needed. At the same time, the interests of herders with large numbers of livestock who wish to rent large parcels must be considered. Balancing these concerns can best be done by the rural municipalities, provided there is a legal framework that allows them to do so. Pasture management should be designated a matter of local significance (exclusive own function of local government) in Kyrgyz law.

Citizen Participation. If pasture management is to be socially accepted by the main users, it is essential that citizen participation be greatly enhanced. This involves two aspects. One is promotion of community-based pasture management within aiyl kenesh territories, whereby (in

addition to the formal bodies of local self-government) grassroots councils are empowered to play a major role in making pasture allocation and management decisions. The second involves providing information and raising the expectations of citizens vis-à-vis their aiyl okmotus with regard to pasture management. Although local self-government bodies are considered the most responsive of all governmental entities, they nonetheless are not immune to corruption and abuse without effective public oversight. In the same survey where 83% endorsed the aiyl okmotus to manage pastures, nearly 90 percent favored the establishment of local pasture users' associations or other ways of ensuring the population's involvement in pasture allocation and management. The prototypes for such community-based user organizations exist in the form of Water User Associations in irrigation schemes and of Village Investment Committees and Local Investment Committees under the Village Investment Project. These CBOs have demonstrated that citizens, adequately supported, trained and empowered, and are willing and capable to manage locally important common resources effectively and responsibly.

Policy and Technical Support. State policy and governmental entities must focus on providing needed support to the rural municipalities and communities. Rural municipalities, particularly local administrations, need assistance to acquire the skills and knowledge to manage pastures effectively and sustainably. The general recognition of the deterioration of pastures and of the need to adopt effective measures is not yet matched in most rural municipalities by the requisite skills to address the problems. Effective arrangements are needed to link Gosregister's and Giprozem's technical capacity (mapping, calculations of carrying capacity, protection against erosion, etc.) and rural municipalities' ability to manage on the ground; the current system requiring payment by aiyl okmotus to Gosregister for its services is not working. Effective monitoring of pasture conditions is also critically lacking at present, and Giprozem should focus its efforts on this issue.

Simplification of Contracts. The current arrangements for obtaining and registering pasture use contracts is extraordinarily cumbersome and unworkable and needs to be rationalized – with an emphasis on transparency and simplification. This requires assigning exclusive use rather than allowing for ad hoc 'open access' use of pastures. It also requires contracts that are enforceable and enforced. The widely held perception of disproportionately high money and transactions cost required to register lease or use agreements with Gosregister pushes most transactions involving pasture use outside the legal system. Not surprisingly, most leases registered with Gosregister involve larger entrepreneurs who are pasturing their herds outside of the community. It is important to put all use regimes on the same legal footing. Consideration should be given to delegating contract registration to the aiyl okmotus.

V. Piloting for Change

Pilot projects are an effective way to test new approaches, study the mechanisms needed to transfer management responsibility to rural municipalities, and foster greater community involvement in decision making. Pilots allow close monitoring, assessing of outcomes, and formulating needed modifications. Considerable experience has already been gained in Kyrgyzstan with pilot projects implemented under the Sheep Development Project and the Central Asian Transboundary Biodiversity Project, as also with the community empowerment model successfully developed under the Village Investment Project, particularly with regard to participatory investment planning and use of community assets. The results of properly designed and implemented pasture management pilot projects would then guide the formulation of

national policy and relevant legislation and regulations as well as subsequent public awareness and capacity building campaigns.

The chief risk involved in shifting responsibility to the rural communities is resource capture by local elites. This is best prevented through total transparency and widespread dissemination of information about rights, responsibilities and the available resources, including pastures. Many of the current problems stem from the lack of knowledge on the part of livestock owners and herders. Information dissemination should be part of a broader program to mobilize rural citizenry to take a stake in the management of their local pasture resources.

Once a community is adequately mobilized and trained to assume (supervised) control over its pastures, it should be provided with some financial resources, linked to some local resource mobilization, in order to implement essential investments in pasture-related infrastructure and pasture improvements. This support should be limited, as funds for subsequent investments and management expenses would be generated through pasture use fees.

Technical assistance should be focused on cost-effective methods for inventorying pasture resources and designing the process by which intensive and remote pastures would be transferred to rural municipalities. Technical capacity at the national and regional levels will also require upgrading to facilitate longer-term planning for sustainable pasture use across the country. Training efforts will need to be geared at the needs of local administrations and pasture user associations, to develop the capacity for designing and implementing viable pasture management plans, to devise monitoring tools that are simple enough to be practically applied, and to identify and help implement affordable measures to rehabilitate degraded rangeland. Training should also involve the setting, collection and use of pasture use fees. Likewise, skills will need to be developed for effective dispute resolution, preserving where possible the existing community mechanisms and ensuring appropriate interface with formal mechanisms established in law – with special care taken to involve the herders themselves in these processes.

Policy and legal expertise will be required to help design and implement the new policy, legal and regulatory framework needed to consolidate pasture management at the level of the rural municipalities. This will involve amendments to the Land Code, the Forestry Code, the Law on Local Self Government and Local State Administration, the Law on Management of Agricultural Land, the Tax Code, and other legislation and regulations. Special attention will need to be paid to providing sufficiently clear general parameters while preserving adequate flexibility for local variation in pasture management.

Chapter 6

Increasing Livestock Productivity

I. Introduction

Current levels of animal productivity are low – due to poor nutrition, the high incidence of diseases, heavy affliction with parasites, and poor animal and farm management. Addressing these constraints, rather than increasing animal numbers or changing the genetic composition of the national herd, is the key to raising output from the livestock sector.

The lack of good-quality fodder to sustain animals through the long, harsh winter is a critical issue. Many animals loose half of their body weight during winter, and mortality among young (underfed) animals is very high. This poor nutritional status is closely linked to the problem of animal diseases. After a long winter with poor nutrition, often having lambed or calved, animals are highly susceptible to (sometimes lethal) infections.

These factors are far more binding constraints to productivity and production than the breeds or genetic characteristics of the animals. The existing animals are reasonably well adapted to local conditions and capable of much higher levels of production than those currently being achieved. Genetic “upgrading” will not bring about any improvement in performance unless the nutritional, disease and management constraints are successfully tackled first. The most urgent need is, thus, improved husbandry and general farm management. In turn, improved farm management has to be underpinned by improved pasture management and animal health care as discussed in Chapters 4 and 5.

II. Inadequacy of Animal Nutrition

On average, and assuming equal distribution over all animals, the total feed (dry matter, DM) available annually in Kyrgyzstan per dairy cow is about 2.3 tons.²³ By comparison, the average feed intake of a dairy cow in Ireland is 4.6-4.9 tons per year, with approximately 85% of it coming from grazed pasture or grass silage. This comparison indicates that the quantity of feed per animal in Kyrgyzstan is low. It also shows that feed supply is a far more pressing concern than increasing the national herd size and that current estimates of the country’s carrying capacity for livestock may be unduly optimistic. Finally, it strongly suggests that the feed constraint on livestock productivity will increase in severity if the current trend of declining pasture productivity were to continue.

Herd Size and Carrying Capacity. Carrying capacity is defined here as the number of breeding females that can be sustained over the entire year. Counting only breeding females, there were

²³ This is estimated as follows:

A.	Total pasture area	=	9 m ha
B.	Average dry matter (DM) production/ha	=	210 kg
C.	Total pasture production	= (A x B) =	1.9 mill. Tons
D.	Other winter feed	=	1.5 mill. Tons
E.	Total feed	= (C + D) =	3.4 mill. Tons
F.	Total no. of animals (sheep equivalents)	=	6.26 mill.
G.	Feed per animal (sheep equivalent)	= (E/F) =	543 kg
H.	Feed per dairy cow	= G x 6 sheep equivalents =	3,259 kg
I.	Assumed efficiency of utilization	=	70%
J.	Feed consumed per dairy cow	= (H x I) =	2,281 kg

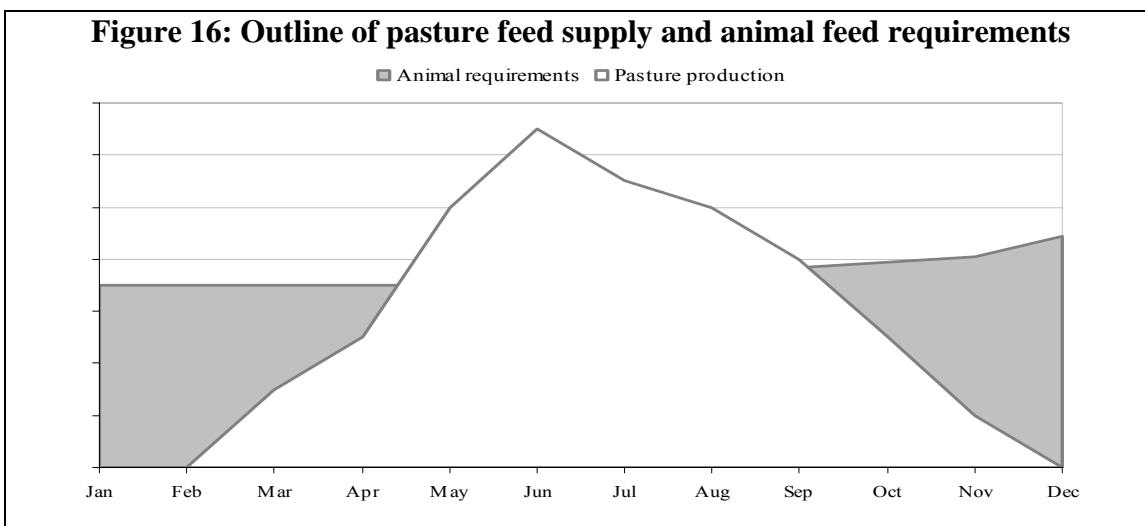
just over 6 million sheep equivalents in Kyrgyzstan in 2003 (Table 20). The much larger pre-independence herd considerably exceeded the country's internal carrying capacity and was sustained by feed imports. The important question, thus, is whether current numbers are in balance with the existing carrying capacity or whether they can be significantly expanded.

Table 20: Livestock Numbers in Kyrgyzstan in 2003

	Sheep	Goats	Cows	Yaks	Horses	Total
Number of breeding animals	2,067,261	649,684	549,699	9,532	157,597	
Sheep equivalent	1	0.7	5	5	6	
Number of sheep equivalents	2,067,261	454,779	2,748,495	47,660	945,582	6,263,777

Source: Natstatcom, Livestock Census 2003

The current herd size is close to the estimated carrying capacity of pastures. FAO estimates the carrying capacity to be 7 million sheep equivalents, while Giprozem estimates it at 6.3 million sheep equivalents. However, these aggregate estimates mask the fact that summer pastures are underutilized while winter and spring/autumn pastures are overgrazed. This means, in effect, that the carrying capacity of the pastures used is being exceeded. More important for policy makers and livestock sector planning, these data also indicate that large increases in animal numbers are not possible without first improving pasture productivity.

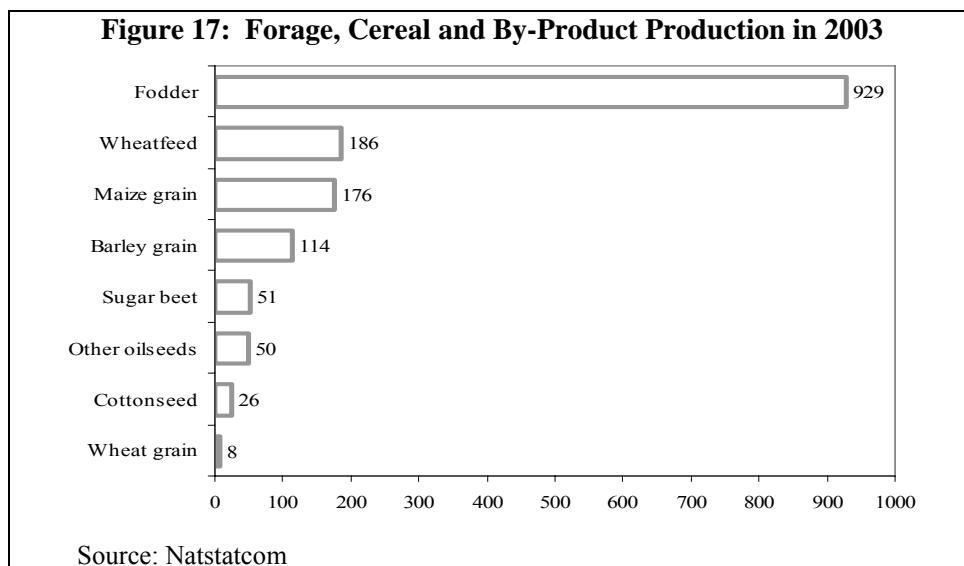


Seasonality of feed supply. As in other countries where animal production is based on pastures with significant seasonal variation in availability, meeting winter feed requirements is a major issue in Kyrgyzstan.²⁴ Feed requirements rise in the course of the year, as animals increase in size and weight and consume more feed. On the supply side, pasture output rates fluctuate with seasonal temperature (and rainfall), typically with a surplus in late spring and summer and with deficits in late autumn and winter. Feed supply and animal requirements are therefore poorly matched, as shown in Figure 16, and the surplus in summer needs to be conserved as hay to cover the deficit in winter.

²⁴ In the transhumant systems practiced before collectivization, animals grazed winter pastures which were rarely adequate to maintain body weight over the long, hard winters, but body fat reserves built up during summer and hay supplements helped them survive in the face of the inadequate winter feed.

In addition to meadow hay, various other feeds can help make up the winter deficit. This includes wheat and barley straw, maize stovers, silages, planted *forage crops* (lucerne and sainfoin) and, where available, *concentrates* such as cereal and oilseed meals, oil cakes and beet pulp. In Kyrgyzstan, forages make up 60% of the total estimated winter feed available; if winter pastures are included this percentage is even higher.

Forage quality. Animal diets in Kyrgyzstan are low in both energy and protein. During the summer months, the diet is typically limited to pasture vegetation, which is reasonably well balanced in nutrient content. However, nutrient content declines if pastures are poorly managed and plants are allowed to become too mature. At the micro level, effective pasture management means (i) ensuring that animals have a sufficient quantity of pasture available on a daily basis and (ii) maintaining pasture quality by grazing it before the vegetation becomes too mature (the new re-growth material will be young, with high energy content). If pasture is plentiful, quality is less important because the animals will select the feed highest in energy and protein. If, however, pasture resources are in short supply (e.g., overgrazed), quality is essential because animals will have to eat more of the material available. Since most farmers at present lack sufficient pasture management skills and experience, they find it very difficult to ensure adequate pasture output for their animals. As a result, both energy and protein supply to their animals are compromised by (i) the low quantity of feed on overgrazed pastures and (ii) the inadequate energy and protein levels in the poorly managed pastures.



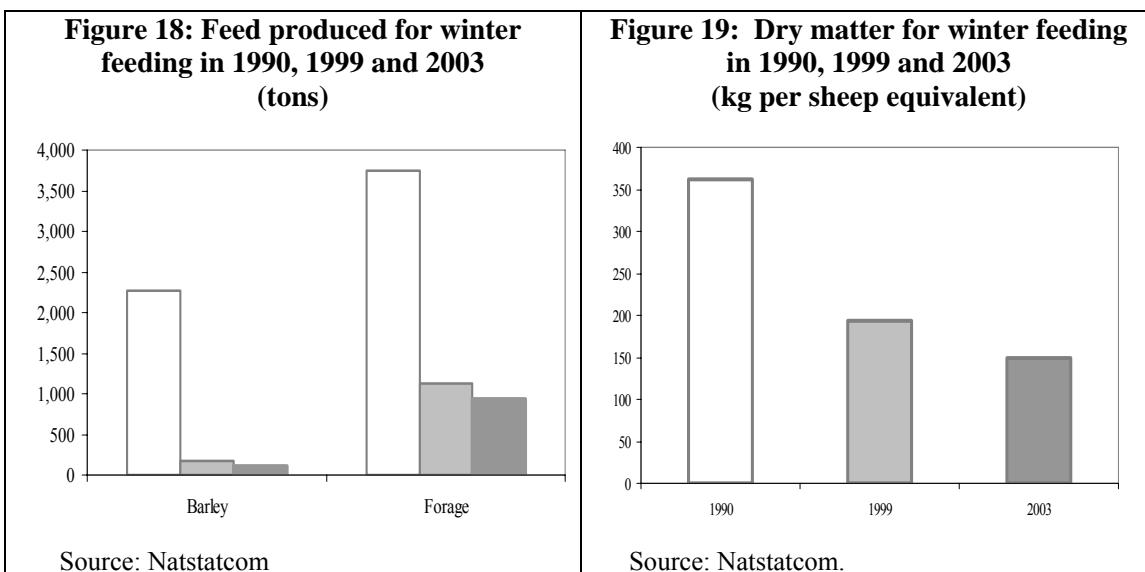
In winter, animal diets are predominantly based on winter pasture, with some supplementary hay (see Figure 17). Some other products such as vegetable wastes, peelings, molasses, and fodder roots may also be fed. The quality of winter pasture is generally poor. It consists of pasture areas that are not covered by snow, some fodder that may have been set aside during the summer, and crop residue such as cereal stubble. It is very difficult to maintain feed quality in pasture vegetation ‘saved up’ from summer growth. Hay is usually lucerne, meadow or sainfoin hay, or barley which did not ripen sufficiently for grain harvesting. The hay is generally cut at a very mature stage and is low in both energy and protein. Straw is naturally very low in both energy and protein.

The shortage of protein could be made up through the concentrate part of the animal diet, but high-protein feeds are not available in substantial quantities. Sunflower and cottonseed cake

and, to a lesser extent, wheat bran are protein feeds, but none of them are of particularly high quality, and the quantities available are small.

In the short run, the best prospect for improving the protein content of animal feed lies with high-quality lucerne hay. At present, most of the conserved lucerne hay is poor in quality and there is substantial further deterioration from the time of cutting to that of feeding. Farmers tend to prefer quantity over quality and therefore harvest hay when the plants are too mature and energy and protein content are reduced. Loss of leaves (the most digestible part of the plant with the highest feed value) during field curing and extensive weed contamination also contribute to low feed value. Finally, poor storage without covering against the weather causes further quality deterioration and losses.

Aggregate forage availability vs. requirements. Figure 18 illustrates the sharp decline between 1990 and 1999 in forage produced. During the Soviet period, winter feed availability was much higher because of feedgrain imports and larger areas under fodder crops (lucerne, sainfoin and barley). Although the decline in animal numbers since Independence has lowered aggregate requirement, forage supply per livestock unit has fallen dramatically below the 1990 level (see Figure 19). If there were sufficient winter grazing, this could compensate for the decline in supplemental feed, but feed available from winter pastures has declined in quantity and quality as a result of overgrazing. The serious shortage of winter feed is, thus, the main problem.



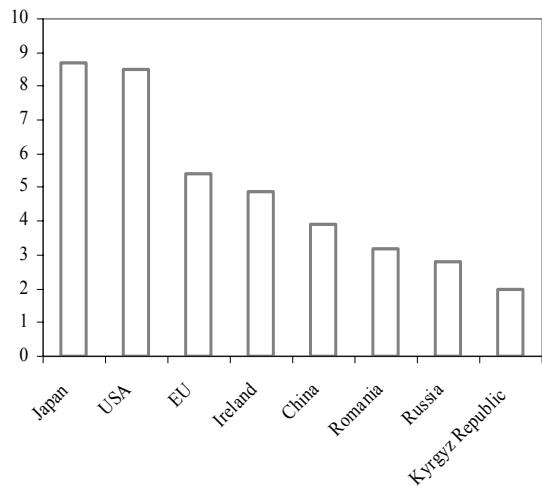
III. Current and potential productivity of the cattle and sheep sectors

A. Dairy cows

Productivity. National milk production statistics imply that the current average milk yield per cow is just over 2,000 liters per year. These data are confirmed by a survey of private farms (BASIS farm surveys) which showed an average yield of 1,890 liters/cow in 2003. However, the Household Budget Surveys (HBS) for 2000 and 2002 suggest even lower yields for cows on household farms, with milk yield averaging 5.4 liters/day. Allowing for 240 days of lactation, the survey data suggest a milk yield of only 1,300 liters annually per cow. Even assuming that

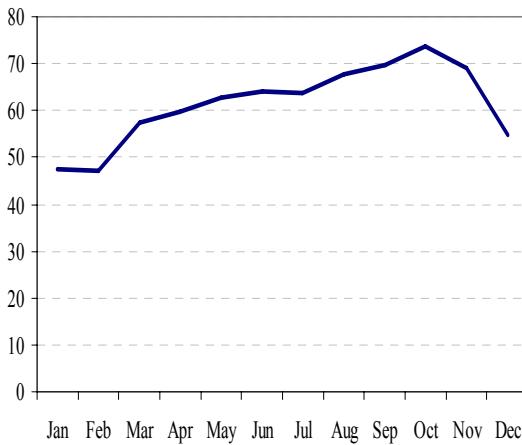
the yield of 2000 liters/cow is correct, yields in Kyrgyzstan are low by international and regional standards (see Figure 20).

Figure 20: Average milk yields in selected countries in 2003 (thousand kg/cow)



Source: FAO

Figure 21: Proportion of milking cows on household farms in 2002



Source: Household Budget Survey

The number of calves per cow, another key indicator of productivity, is also very low. Calving rates provide a measure of farmers' success in getting cows back into calf so that they can begin a new lactation. Moreover, calves are the initial raw material for beef production. According to the 2003 Livestock Census the ratio of cows to calves under 1 year old was 1:0.53. This ratio is low and indicates poor cow fertility and/or high abortions/high mortality of calves. For comparison, in highly developed economies the ratio of cows to calves is 1:0.75. Data from the HBS provide corroborating information on the proportion of lactating dairy cows at any one time (see Figure 21): the percentage of lactating cows peaks at 74% in October, but is less than 50% for some months of the winter. Further evidence of low calving rates comes from a recent in-depth assessment of livestock issues in selected villages, which reports calving rates of 60-70.²⁵

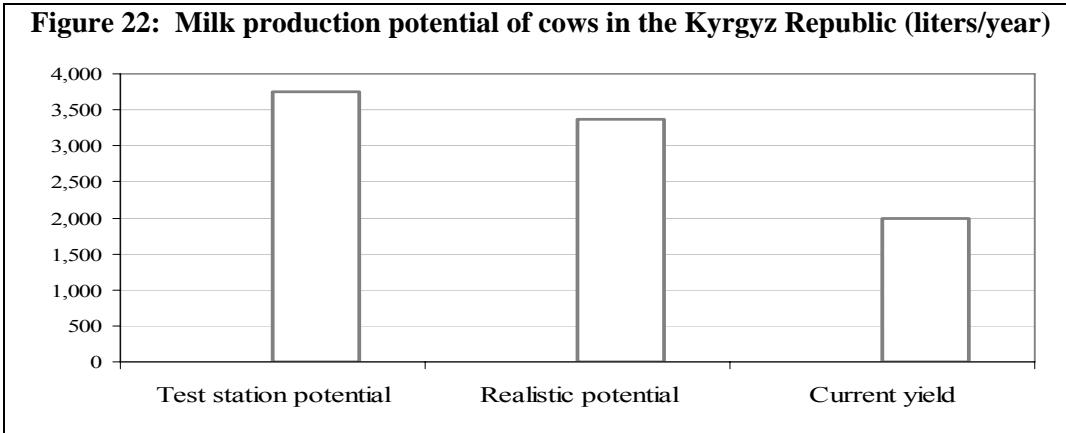
These data show that each year a substantial proportion of cows remains dry. Indeed, many calve only every second year. Lactation periods are short, well shorter than the worldwide standard of 305 days, and field studies confirm that dairy cows have long dry periods. The fact that milk production peaks in October implies that many cows calve in summer or autumn, not a good practice on farms relying on seasonal pasture production, where calves should be born around the start of the grazing season.

Productivity potential. FAO data on the genetic potential of the three main dairy breeds in Kyrgyzstan suggest typical milk yields ranging from 3,250 to 4,770 kg per 305-day lactation.²⁶ Genetic potential is, thus, not the critical problem – but sub-optimal nutrition, health care and husbandry practices keep these animals from achieving their full potential productivity. Test station yields of the breeds prevalent in Kyrgyzstan demonstrate that yields of 3,500 to 4,000

²⁵ NZAID (2005).

²⁶ Data from the 2003 Livestock Census indicate that 38% of the cow population was of three breeds. The Alatauskaya breed dominates, with significant numbers of Aulieatinskaya and Cherno-pestraya. The other 62% of the herd consists of crosses of these breeds. The information about the genetic potential of these breeds was obtained from the FAO.

liters per annum are possible. Recognizing that test station performance tends to be better than on-farm performance, a realistic target for commercial dairy farms should be 3,150 - 3,600 liters, or 10% less than test station performance, with an average of 3,375 liters per annum. This is almost 70% above current average yields (see Figure 22). National milk production could therefore be increased by 70% without any increase in cow numbers or any breeding program to improve genetic potential.



Constraints to productivity growth. The main causes of the present low productivity can be summarized as follows:

- Poor nutrition, both during summer when cows are feeding on overgrazed village or nearby pastures and in winter when inadequate quantities and quality of winter feeds are available. As a result, milk yields are low and lactations are short.
- Unavailability of bull or artificial insemination (AI) service to many smallholders with resulting long dry periods between lactations. Calving is spread throughout the year, rather than concentrated in spring when new pasture is becoming available.
- Animal diseases and internal and external parasites (e.g., round worms, liver fluke, lice and Asian ticks).
- Lack of knowledge and husbandry skills among farmers.
- Poor quality shelter with bad ventilation which can often be worse than no housing in terms of risk of disease.

Nutrition during the grazing season. The imbalance in pasture use (undergrazing of summer pastures, and overgrazing of winter and village pastures) must be corrected. Dairy cows need to be kept on near-by pastures all year, except during dry periods, for ease of daily milking and rapid dispatch of milk to markets. As long as these close-in pastures are over-grazed, the dairy sector will be constrained by undernutrition. Therefore all impediments to sheep and dry cattle using summer pastures need to be removed. Pasture management techniques need to be improved at the village and near-by pastures to improve their utilization; this would include controlled grazing, weed control and possibly some judicious use of fertilizers.

Winter nutrition. Fodder conservation needs to be improved by cutting fodder crops at the correct time, avoiding in-field losses, good storage, and good management practices at feed-out. Because of supply constraints for cereals and other concentrates, the Kyrgyz dairy industry is unlikely to become a grain-based system, but greater availability of grain through higher cereal yields would potentially have significant impact on animal nutrition and the dairy sector. In a mixed crop and livestock farming environment, as that of Kyrgyzstan, the crop and livestock

subsectors can obviously not be considered in isolation from each other. Animals benefit from feed resources generated in the crop subsector, and they can return much recycled feed to the fields in the form of manure.

In Kyrgyzstan today, with limited availability of arable land, high crop yields are essential. To maintain one cow indoors over 120 days of winter requires more than 1.5 tons of hay (75% dry matter) or 6 tons of fresh silage (20% dry matter). If sainfoin hay is the main feed source (yielding 10-15 tons of DM in four cuts), the number of cows that can be kept over winter with one hectare of sainfoin ranges from 5 to a maximum of 8. However, to maintain sainfoin yields at the required level requires reseeding every four years and rotating crops across the farm area, which at least doubles the area required.

Non-seasonal calving. In a pasture based system as in Kyrgyzstan, farmers should aim to minimize the nutrient requirements of the cows in the winter period when feed is scarce and dear. This is achieved by calving in springtime when pasture vegetation growth recommences.²⁷ This is not practiced in Kyrgyzstan where calving occurs throughout the year. The main reasons probably are poor availability of a bull or AI service, leaving farmers little option but to get cows in calf whenever the opportunity arises, and poor appreciation of the importance of, and benefits from, seasonal calving. Many cows are kept in very small herds of 1, 2 or 3 cows, and their owners rarely have a bull for breeding. Poor access to bulls or an AI service means that cows often only calve every second year and often calve outside the optimal time of spring.

Animal diseases. Of the many diseases that affect dairy cows in Kyrgyzstan, those most likely to affect productivity are brucellosis and parasites (internal and external). Parasites can affect animals indoors and outdoors (the spread of external parasites is much more rapid indoors, while internal parasites can be spread year-round) and are an important cause of reduced productivity.

Other constraints. Poor animal housing and poor farmer technical knowledge are issues that need to be addressed through effective and broad-coverage advisory service and/or training. Farmers need advice, for instance, on feeding balanced rations; the common practice of feeding barley with meadow hay represents a diet very deficient in protein.

B. Sheep

Productivity. Output from the sheep sector at the farm level is best measured by an index such as number of lambs sold per 100 ewes put to the ram, but such data are not available. However, the information from the 2003 Livestock Census provides some indication: there were just over two million female sheep of breeding age and 700,000 million lambs under 1 year old. This implies 34 progeny per 100 females of lamb-bearing age, but is an underestimate because some lambs will have been slaughtered before being counted in the Census. Nevertheless, the implied productivity is still low, as is confirmed by mutton consumption data from the HSB. Even assuming that 20% of mutton production is exported, the HBS data only suggest a figure of 40 lambs per 100 females of lamb-bearing age. A very recent field report indicates a lambing percentage of 60-70, but it also reports high mortality among lambs.²⁸ Thus, all indications are that the output of lambs is between 40 and 60 per 100 ewes, which is low. The figure for

²⁷ This is practised in other pasture based countries such as New Zealand and Ireland, where about 90% of cows calve in the spring.

²⁸ NZAID (2005).

comparable hill sheep systems elsewhere (Ireland, New Zealand) is 93 lambs per 100 females of lamb-bearing age.

In Kyrgyzstan, lambing takes place year round, because planned breeding has fallen into disuse. This is detrimental to performance and makes management very difficult. In a pasture based system, sheep should lamb around the time that spring grass is becoming available. This is essential because the 2 weeks before lambing and the first 4-6 weeks after lambing are the period of highest energy and protein requirement of the ewe for the latter stages of pregnancy and then early lactation. Good nutrition during this period is essential so that lambs are strong and healthy at birth and ewe milk yield is sufficient to ensure good lamb survival and good lamb growth.

Potential productivity. There is no reason why Kyrgyz sheep cannot produce a similar number of lambs as those in Ireland or New Zealand. The conclusion, again, is that nutrition and management are sub-optimal and should be corrected before substantial effort is put into improving the genetics of the animals.

Increasing **wool** output is mainly a function of increasing sheep numbers and, as Chapter 3 suggests, increasing the quality and value of the wool is a function of handling and storage, segregation of different wool grades, and marketing. At this stage, it is clear that improving the quality and marketing of the wool will give much larger dividends than increasing the volume of wool production.

As noted earlier, the carrying capacity of Kyrgyzstan' pasture areas is in reasonable balance with the current number of animals and there is therefore not much, if any, scope for large increases in sheep numbers. Increases in output will thus have to derive from improved productivity of the existing sheep, and output can be increased by 50% by improving the number of lambs per ewe.

Constraints on productivity growth. The critical constraints to sheep productivity are: (i) low lambing rates, (ii) high lamb mortality and poor growth rates, and (iii) year-round lambing.

Lambing rates and lamb growth. The low lambing rates are due to poor ewe nutrition (leading to low fertility), out-of-season breeding, and unavailability of rams. Out-of-season breeding is the first issue to tackle. Rams need to be kept away from ewes except when they should be mating in late autumn/early winter. Ewe nutrition in the last 6 weeks of pregnancy should be improved. The same problems arise as with dairy cows in terms of quantity and quality of feed. As a minimum, the best quality hay should be kept for this period. Diseases need to be tackled, in particular brucellosis (which causes direct lamb losses through abortion) and internal/external parasites.

Lamb mortality. The primary cause of high lamb mortality around birth is inadequate colostrum and milk supply from the ewe, which is related to poor ewe nutrition. Winter lambing should therefore be avoided, since the cost of concentrate supplements at this time is prohibitive. Other factors are bad weather, predators and diseases. Well-fed lambs have much greater resistance to bad weather and diseases, and diseases can be further tackled by good hygiene at lambing time. In lambs born in spring, movement to summer pastures with good pasture supply is the best way to ensure good **lamb growth** rates.

Diseases. Many serious diseases affect sheep in Kyrgyzstan, such as brucellosis and foot and mouth disease. Controlling brucellosis and parasites (round worms, liver fluke, lice and Asian ticks) will have the greatest effect on productivity.

Other constraints. Other constraints such as poor farmer knowledge of good husbandry practices need to be tackled through technology transfer, via an effective advisory service and/or training.

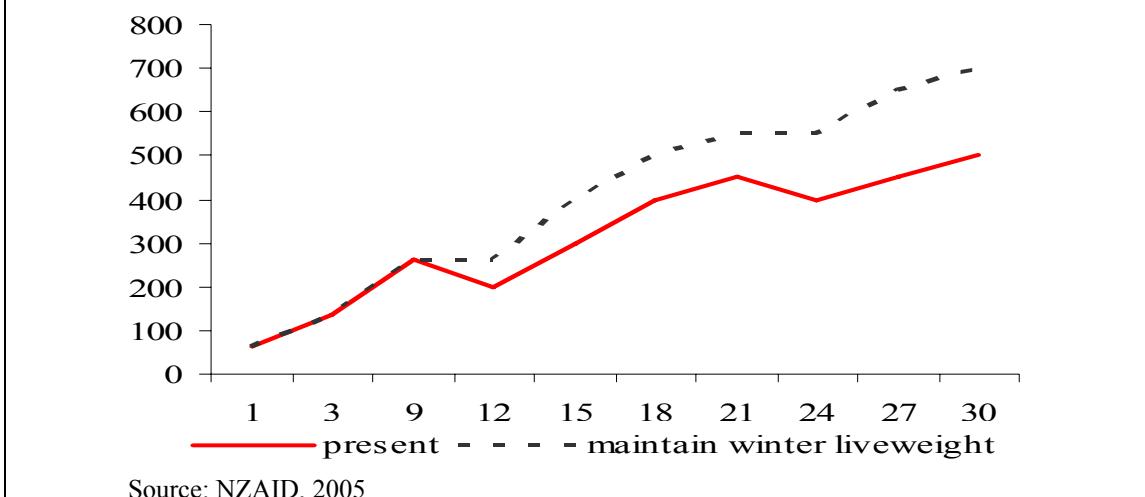
C. Beef cattle

There is not a significant number of specialized beef breed cows in Kyrgyzstan, and the beef industry is based on calves produced by dairy cows. Beef cattle productivity at the farm level is usually measured by some measure of growth, such as average daily weight gain or carcass weight at slaughter. These data are not reliably available for Kyrgyzstan.

The estimated range of carcass weight (assumed equal to beef output per animal) falls between 187 and 224 kg. The 2003 Livestock Census data suggest that some animals are slaughtered in their second year (the number of 1-2 year old animals reported is lower than that of calves under 1 year), but many survive into their third year before being slaughtered. Average age at slaughter is therefore around 2+ years. The carcass weight estimated above, even at its upper end, is low for animals of this age. The actual size of beef carcasses in Kyrgyzstan is probably even smaller than estimated, as the assumptions used (volume of live exports and the contribution of culled cows to beef output) were conservative.

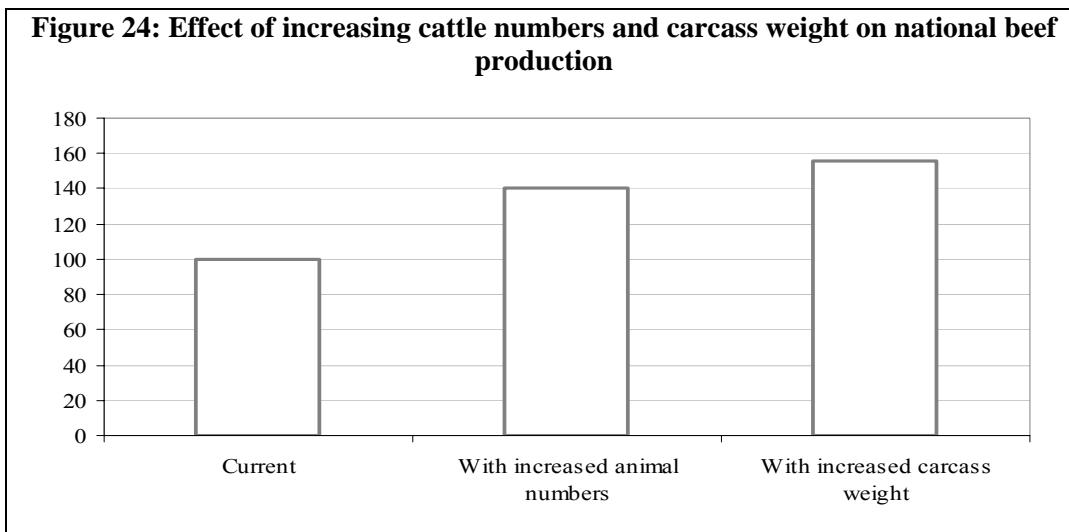
Potential productivity. The low carcass weights are not surprising, as some reports state that animals loose up to 50% of their bodyweight in winter (see Figure 23). They go through repetitive cycles of gaining weight, loosing it, regaining it and growing further. As in the case of dairy cows, nutrition and management are sub-optimal and that the current breeds are not realizing their full genetic potential. Nutrition and management need to be improved so that the current stock can perform to its potential before any substantial effort is put into improving the genetics of the animal herd. Given the present cattle breeds in Kyrgyzstan, a carcass yield of 250 kg/animal is a reasonable expectation, provided nutrition and management are good. This would represent an increase of 12-33% over estimated current national beef output.

Figure 23: Actual and potential (improved winter nutrition) live weight of cattle (in kg)



Although there is no significant scope for increasing the animal numbers, a large increase in annual beef cattle offtake is possible if the number of calves born and reared is increased. In 2003, there were 294,000 cattle under 1 year old. These represent the raw material for beef production. With 549,700 breeding cows in 2003, one could reasonably expect that the number of calves under 1 year old should be 412,000 -- i.e. that 75% of the breeding cows would have produced a calf that was still alive. If calf numbers were to increase to 75% of the number of cows, this would mean an increase of 40% over current national beef output.

Increases in both the number and the size of slaughter animals can be attained simultaneously, and this would result in an overall increase in beef output of well over 50% (see Figure 24).



Addressing the constraints. The key constraints to achieving better productivity and raising output are the same that also limit growth in the dairy and sheep subsectors: poor nutrition, low calving rates, high mortality among young animals, diseases and parasites, poor shelter and general husbandry practices, and limited farmer know-how and skills.

Nutrition. Poor nutrition, primarily caused by the imbalance in grazing (undergrazing of summer pastures, and overgrazing of winter and village pastures), is the single most binding constraint. Weight gain in summer is slow, when cattle are feeding on overgrazed village or nearby pastures, but could be much faster if the animals were moved to summer pastures. During winter, inadequate quantities and quality of winter feed cause weight growth to be negative, with animals losing up to half their body weight. Animals need to be moved to summer pastures where there is a plentiful supply of feed to support excellent growth rates. This requires removal of all impediments (administrative, structural, logistical, etc.) to cattle using summer pastures.

Improving winter nutrition requires improvements in the quantity and quality of winter feed. Unless animals are being prepared for winter slaughter, high rates of weight gain are not essential in winter. Animals with poor weight gain during a period of moderate/poor nutrition will, through compensatory growth, largely recoup any lost ground during a subsequent period of good nutrition. Compensatory growth is well exploited in many cattle rearing systems, but the

weight loss experienced by cattle during Kyrgyz winters is extreme, resulting in low carcass weights.

Calving rates and calf mortality. Increasing herd offtake can be achieved by increasing the calving rate and reducing calf mortality. This requires action primarily in the areas of nutrition and disease control. Poor nutrition causes low fertility of cows and high mortality of calves. Inadequate disease control causes high rates of abortions and calf deaths.

Disease control. Brucellosis is, of course, a serious problem, causing numerous spontaneous abortions each year. Of the many other cattle diseases prevalent in Kyrgyzstan, those most likely to affect calf survival and weight gain are calf diseases (e.g., scour, pneumonia, joint ill) and internal and external parasites. Poor hygiene and housing conditions contribute to the incidence and spread of calf diseases, as does poor nutrition of the cows. Any disease or nutritional deficiency that causes poor milk production or poor quality of the colostrum will cause increased calf mortality.²⁹ Parasites can affect animals indoors and outdoors (spread of external parasites is much more rapid indoors, while internal parasites can be spread all year round) and are an important cause of reduced productivity.

IV. Conclusions and agenda for action

The main conclusions are:

- (1) The current animal numbers in the country appear reasonably close to the carrying capacity of the pastures. However, there is a serious imbalance in pasture utilization, with undergrazing of summer pastures and overgrazing of village/near-by pastures.
- (2) Winter nutrition is poor. Both quantity and quality of winter feed are poor, and animal diets are deficient in the major nutrients, energy and protein.
- (3) Animal productivity is low, but there is substantial potential for improvement.
- (4) Diseases and parasites are major problems, with significant negative impact on animal productivity.
- (5) Farmer knowledge of husbandry and management techniques is deficient.

Accordingly, the main issues that need to be tackled to achieve increases in animal productivity are animal nutrition (pasture management and winter feed), disease control, and farmer know-how. The critical importance of better pasture utilization and management, especially the need to remove all impediments to farmers moving animals to summer pastures and improving farmers' pasture management skills, is discussed in detail in Chapter 5. The recommended approach to disease and parasite control is set forth in Chapter 4.

Farmer Know-how. The skill and knowledge levels of many farmers concerning animal husbandry, nutrition, and pasture management need to be raised. This requires training and extension advice and, therefore, increased outreach and coverage of the Rural Advisory Service (RAS). Improved farmer know-how will be a strong driver of change and improvement at the present stage of development of the Kyrgyz livestock economy. The necessary pre-conditions are in place: RAS is present in each raion, providing an effective institutional structure through which training and advice can be provided, and good technical information is available (e.g.,

²⁹ Born without immunity from disease, calves must obtain the necessary anti-bodies to provide immunity in early life from the cows' first milk – the colostrum.

findings of various pilots, experiments and studies) that can be used to formulate recommendations. Specifically, extension activities could focus on four priority issues:

- ***Winter feed*** – educating and encouraging farmers to cut hay and fodder crops at a more suitable stage of growth and minimizing losses in the field, during storage and at feed-out.
- ***Controlled sheep breeding*** – urging farmers to target lambing around the time that grass growth commences in spring, so that there is plentiful supply of grass to ensure that the ewe has adequate milk and that lambs survive and grow well.
- ***Controlled cattle breeding*** – teaching farmers about the benefits of cows calving in the spring so that there is good feed availability when the cow needs it during the early lactation. The relevant advice should be supplemented with the promotion of (privately provided) AI programs targeting the many small cattle producers.
- ***Disease control*** – raising farmer awareness of animal diseases and of the production and financial implications of failure to prevent/treat them, recognizing symptoms, applying appropriate preventive measures, reporting and treating diseases.

Chapter 7

The Role of the Public Sector

I. Introduction

The rationale for the recommended reforms of public policies and institutions concerned with livestock production is the same as in other sectors: withdrawing from roles and activities which the private sector can do and focusing on those that the private sector cannot perform. The context for reform in the livestock sector is, however, quite different – a massive increase in the number of clients (small-holder farmers replacing a limited number of collective enterprises) requiring public services, and a massive decrease in the number of livestock. Faced with these dramatically changed sectoral characteristics, and with scarce budgetary resources, the public sector needs to make substantial adjustments from its past practices to be able to provide effective and affordable core services. Hence, difficult choices must be made about what services and by which institutions need to be performed. In addition, serious thought needs to be given to devising and applying new approaches to public service delivery that are in tune with the principles of a market economy.

To date, public policy has not always been consistent with the increasingly commercial orientation of producers. Indeed, it very frequently still creates false expectations of public support among the participants in livestock commodity supply chains. These expectations may concern hopes for public support (that often fails to materialize for lack of resources or benefits only a few for reasons of deficient targeting) or fears of distortive market interventions that prevent private agents from expanding their interest in the sector for fear of risking their investment. Unpredictability and inconsistency in policy pronouncements and program design are detrimental to the confidence of private economic actors. More clearly delineated -- and more realistic -- definitions of the public sector's roles and responsibilities are therefore critical to sustained development of the livestock economy. Similarly, the sector development strategy and plan must be internally consistent and in full harmony with overall agricultural and macro-economic policies.

As MAWRPI considers its future priorities in the livestock sector it needs to keep firmly in view the importance of making the most effective use of the limited resources available. This means limiting the range of activities and improving the cost-effectiveness of those that remain in the public domain. It also means recognizing that the clients today and in future are not a few large-scale operators, but large numbers of smallholders. Services and service delivery mechanisms need to be designed accordingly. To take two specific subjects: animal breeding is not a priority activity for Government -- promoting the development of efficient private artificial insemination services is; fodder production is not an appropriate task for Government – but promoting the growth of a private seed industry that can deliver quality fodder seed is. The assessment of the Kyrgyz livestock sector summarized in this report suggests that key areas requiring policy attention and effective program implementation are animal health, the management of grazing lands, extension and applied research (especially to improve animal husbandry), and food quality and consumer safety.

II. Overview of Past and Present Government Programs

Over the past decade the Government has introduced, or announced, a number of programs aimed at developing the livestock sector. Table 21 lists the main programs that were identified

at the end of 2004. Each of these completed, ongoing or proposed programs refers to a real or perceived problem or constraint in a particular subsector of the livestock industry and entails, from the Government's perspective, a set of activities intended and expected to overcome these problems. As a result, many of the programs aim to achieve a very broad range of improvements, but stand little chance of being implemented because funding is insufficient for full implementation and/or the time frame is too short to achieve results. Many programs postulate annual target increases in the number of livestock or in production levels, but rarely are explanations or substantiation provided to show how these targets were determined or how the programmed activities will cause them to be realized. In formulating these types of programs, no account is taken of the fact that farmers now operate in a market environment, that they respond to changing market forces, and that they have an over-riding need to achieve sustainable livelihoods.

Where the programs mention legislative change, specific changes are rarely spelled out, and the institutional changes needed to accompany and implement these measures are ignored. In some cases legislation is mentioned as a means of "persuading" the private agricultural sector to meet the aims of the programs. This is not an approach that works well in a free market economy.

There also is some inconsistency within and among programs. For instance, the proposed Development of Procurement and Export (Marketing) System program is mainly orientated at improving exports, but at the same time advocates changing the tax structure and increasing import duties. Conversely, the national Concept of Agricultural Development proposed to help increase agricultural exports to neighboring countries by means of the mutual reduction of customs duties, a policy which the Government is still committed to pursue.

As MAWRPI officials recognize, to date these various programs have had little impact. This is not surprising, if it is appreciated that most of them have been and are merely statements of intent, are not backed by sufficient funding, fail to recognize the power of market incentives and disincentives, and do not account for the necessary productive interaction that should take place between Government and the private sector.

Box 4 Government Programs in the Livestock Sector

Completed Programs

Alfalfa Cultivation Development
Concept of Agricultural Development
Rural Development
Village Development
Sheep Breeding Development

On-Going Programs

A Concept of Comprehensive Yak Farming
Horse Breeding Development
Development of Poultry Breeding
State Owned Pedigree Cattle farm (F A Strelnikova)
National Program for Tuberculosis II
Bee Keeping Development

General Programs

Animal Health
Food Processing and Food Safety

Proposed Programs

Second Alfalfa Cultivation Development
Livestock Sector Development
Pasture Management
Development of Procurement and Export (Marketing)
System for Agricultural and Agro-Industrial Commodities

III. Findings from Stakeholder Consultations

Importance of Livestock Issues. Nearly all stakeholders surveyed regard poor animal health and the lack of an effective veterinary service as the most important problems limiting the further development of the livestock sector (see Table 22).³⁰ Other key issues identified are, in order of rated importance, more effective breeding programs, improved advisory/extension services, better systems for marketing livestock and livestock products, and improved pasture management. In each case more than 84 percent of the respondents consider these issues to be important constraints that need to be removed if the livestock economy is to move forward.

Table 21: Stakeholder perception of priorities in the livestock sector

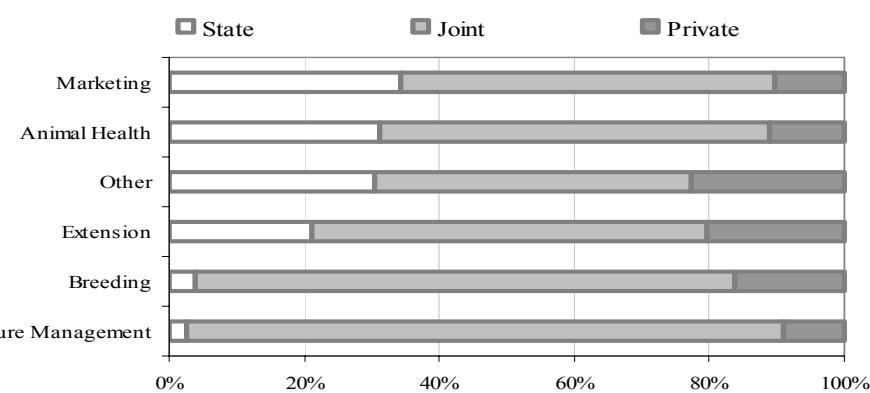
Priority	Rank*
Animal Health	4.4
Breeding	3.7
Advice and extension	3.7
Other	3.7
Marketing	3.6
Pasture Management	3.6

*Ranked from 5 – “Serious problem” to 1 – “Not a problem”.

Source: Stakeholder survey.

Responsibility for Solving these Issues. Nearly half of the stakeholders think that the animal health and veterinary problems should be solved jointly by both Government and the private sector (see Figure 25). There is strongly held and widespread belief that control of the main animal diseases should be tackled by both the public and private sectors. For each major disease, over half of the respondents state that the animal owners would be willing to bear part of the costs of control. Another area where stakeholders think that the Government should play a major role is marketing of livestock and livestock products. This perception that Government should be responsible appears to be the direct result of current policies by which Government is trying to control the activities of the private sector. This policy creates the wrong expectations among stakeholders and leads to confusion in the private sector.

Figure 25: Responsibility for problem solving

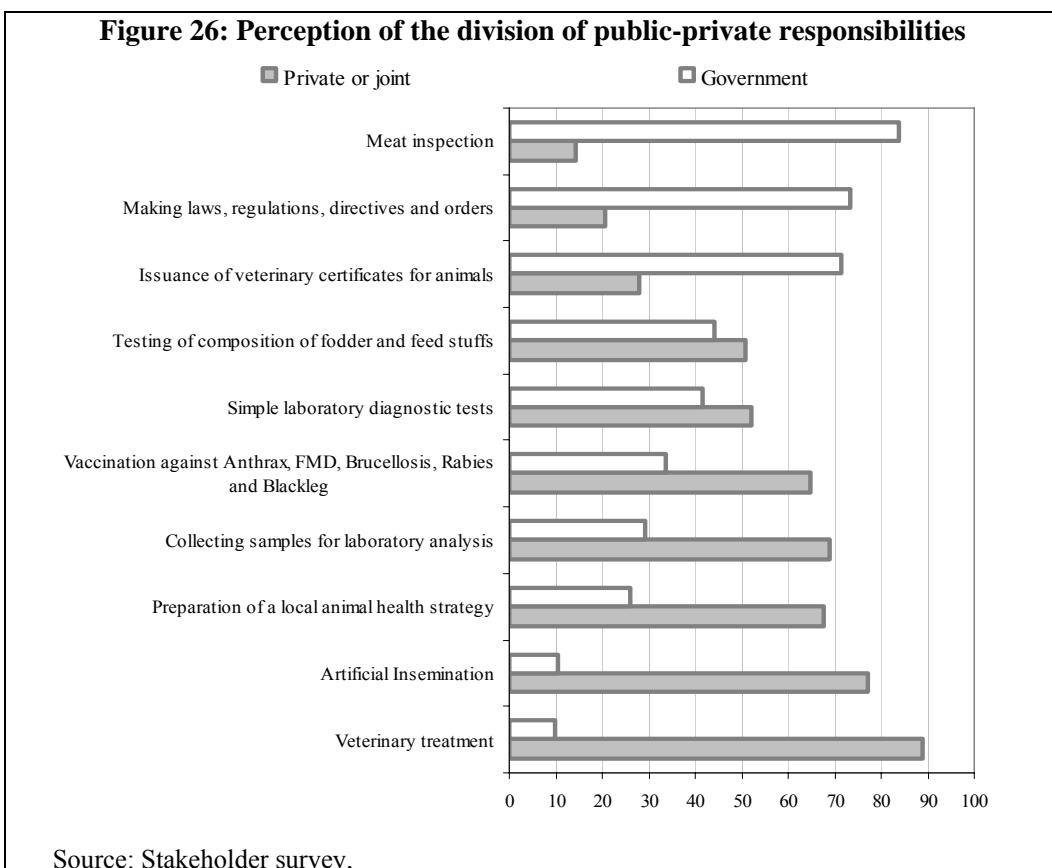


Source: Stakeholder survey.

³⁰ See Chapter 4 for the description of the survey.

The majority of stakeholders perceive improved pasture management and advisory services to be the joint responsibility of both the private sector and Government. In the case of pasture management, over three quarters of respondents think that the private sector should take primary responsibility and that all pastures should be managed at the Aiyl Okmotu level.

The last part of the survey asked respondents who should take prime responsibility for other issues affecting livestock production. The responses are summarized in Figure 26. They indicate the private stakeholders are very willing to work in partnership with the Government on those issues where joint responsibility is required in a market economy. The respondents recognize that developing legislation is the responsibility of Government, but a significant proportion believes that the private sector should be involved in developing such legislation.



The respondents have a balanced view on the task division between the public and private sectors on other issues. The largest role for Government they see in meat inspection and in the issuance of permits. They see a lesser role for Government in the area of vaccinations and believe that farmers and private veterinarians can take on more responsibility. Artificial insemination (AI) and individual treatments of animals are seen as private goods. Vaccination, formulating and organizing animal disease control strategies, and collecting samples are seen as joint responsibility tasks.

Clearly, then, the veterinary problems are considered the most serious, and Government will have to improve the efficacy of its monitoring and control activities. Stakeholders still see Government as responsible for food safety and for testing for diseases and fodder quality,

probably because nobody has ever seen private testing under governmental license and supervision. Finally, the private sector is prepared to contribute much more towards veterinary animal health care and pasture management than current policy allows.

III. Review of Public Expenditure in the Livestock Sector

Most direct public support for Kyrgyz livestock production comes from the annual budget of MAWRPI. Total MAWRPI budget expenditure (excluding investment projects financed by external donors) has increased by 16% in real terms since 2001, financed by increased budget allocations and strong support from a European Union (EU) budget support program (see Table 23). More efficient budget management has also helped to increase actual public spending for agriculture, by raising the annual utilization of budget allocations from 82% in 2001 to more than 99% since 2003.

Nevertheless, public expenditure on agriculture remains very low in absolute terms, severely limiting the MAWRPI's capacity to provide adequate services in legitimate areas of government activity. This financial constraint will continue for the foreseeable future, for two reasons. First, the need for fiscal rigor in all sectors will limit overall public expenditure increases to commensurate increases in public revenue. Second, as EU budget support is phased out, increased government expenditure will replace EU support rather than increase total expenditure. The medium-term challenge for MAWRPI is, thus, to develop an adequate, affordable system of essential public services which can be financed independently of EU support. To meet this challenge, MAWRPI will need to rationalize and improve the efficiency of essential public services, introduce user fees for selected services, and privatize all non-essential services.

Table 22: MAWRPI Recurrent Budget Expenditure 2001-2005

Planned Expenditure	2001	2002	2003	2004	2005	% Increase	
	Million Som (current)					Nominal	Real^a
Water Resource Management	240	326	316	388	265	10%	-5.%
Veterinary Services	63	105	120	92	119	87%	61%
Plant Protection	30	42	47	35	33	8%	-8%
Inspection Services	9	11	14	15	29	213%	168%
Land Reform and Land Management	8	12	105	13	15	101%	73%
Research	4	8	12	18	22	405%	333%
Extension Services	0	1	5	2	3	n.a.	Na
Other Programs and Services ^b	21	105	17	19	21	1%	-13%
Total	376	515	541	582	508	35%	16%
Memorandum							
Actual Expenditure %	82%	90%	99%	100 %	n.a.	n.a.	n.a.
EU Support	225	252	215	224	n.a.	n.a.	n.a.
EU Support as %	60%	49%	40%	39%	n.a.	n.a.	n.a.

Source: MAWRPI;

^a In 2000 soms, deflated by CPI; ^b Includes central administration

Funding for the public veterinary system accounts for 23% of the total budget for 2005, and livestock activities associated with research, inspection and animal breeding account for a further

5% (see Table 24). In terms of service provision, epizootics³¹ is the major element of public support for the livestock sector (38%), followed by laboratory analysis (18%) and research (8%). Support for livestock breeding is the fastest growing element of public expenditure in the livestock sector, most of which is used for horse breeding.

Salaries and social fund contributions were the largest item of budget expenditure on veterinary services (38%) for 2004, followed by livestock medicines (epizootics) which accounted for 8% of veterinary service expenditure. EU support for livestock activities is proportionately higher than for other MAWRPI activities. While this ensures more resources in the short term, it also creates greater uncertainty as to how these activities will be funded once EU support ceases.

Table 23: MAWRPI Budget Expenditure on Livestock Production 2001-2005

Planned Expenditure	2001	2002	2003	2004	2005	% Increase	
	Million Som (current)					Nominal	Real^a
Veterinary Services							
Administration	21	28	32	30	32	47%	26%
Laboratories	9	16	19	21	25	180%	140%
Epi-zootics	29	56	62	35	55	87%	61%
Monitoring	4	5	7	6	7	94%	67%
Inspection Services							
Vet Sanitary	0.4	1	1	1	1	118%	87%
Research							
Pastures and Fodder	3	5	4	4	4	39%	19%
Livestock Institute	0	0	1	4	8	n.a.	n.a.
Animal Breeding	0.4	0.4	6	7	11	2,597%	2,211%
Total Livestock	68	111	133	109	143	112%	81%
Memorandum items							
<i>Livestock as % Total Budget</i>	18%	22%	25%	19%	28%	n.a.	n.a.
<i>EU Livestock Support</i>	37	79	85	59	na	n.a.	n.a.
<i>EU Support as % of total</i>	55%	71%	64%	55%	na	n.a.	n.a.

Source: MAWRPI;

^a In 2000 soms, deflated by the CPI.

Given the high current rates of livestock mortality and the extent to which this reduces productivity and impedes production increases, measures to improve animal health are a clear sectoral priority. This need is not being met. Livestock losses remain high, endemic diseases remain widespread and uncontrolled (with associated human risks), and livestock management practices remain sub-optimal -- despite the significant increase in public expenditure on livestock production noted above. More effective measures are required to improve the quality of both public and private veterinary services, improve farmer know-how of improved livestock husbandry practices, and to increase the availability of and access to livestock feed.

A more effective animal health system is the starting point for this response, based on measures to strengthen both the public and private veterinary systems and create a more effective partnership between them. The public veterinary system should focus on the monitoring and

³¹ Control of epidemic diseases in animals.

control of endemic animal diseases, but private veterinarians should be contracted to implement vaccination programs and given more freedom to import and distribute appropriate vaccines. Farmer incentive to participate in control and vaccination programs should also be increased by providing free vaccinations and by paying adequate compensation for animals that have to be destroyed. Where appropriate, donor support should be obtained to help fund such compensation programs. There is also scope to improve the efficiency and cost-effectiveness of the national laboratory system, through the installation of more modern laboratory equipment and computer-based analysis and communication systems, coupled with appropriate upgrading of staff skills. The national laboratory network should also be rationalized, with full-fledged laboratories operating at the national and regional levels only, while smaller facilities for routine tasks should be divested to private owner-operators who would charge fees for their services.

Current public research and extension programs should be reviewed, to assess their relevance to small-scale livestock production and to the specific problems faced by livestock producers. The significant increase in public expenditure on these programs has yet to make a demonstrable impact on national productivity levels and production systems. The research and extension activities directed at pasture and fodder use warrant particular attention in this respect, to ensure that they lead to more effective use of communal and government-owned grazing lands. To this end, these programs should encompass measures to develop effective local governance of these resources – on a fee paying basis.

The rapid increase in public support for animal breeding programs, particularly its apparent focus on horse breeding, should be seriously questioned. There is little point in allocating substantial resources to improving genetic potential when poor animal health and inadequate feed are the principal constraints to increased livestock production. In the short and medium term, the resources allocated to these breeding programs could certainly be used more effectively in with greater impact on the economy elsewhere.

VI. Priority Policies and Programs for Livestock Sector Development

Priority Issues. Public and private stakeholders agree that there are four key issues currently facing the livestock industry in Kyrgyzstan. They impact upon both farmers and the economy as a whole, and unless they are addressed in the very near future they will prevent further development in the sector:

- Animal Health
- Management of Pastures
- Animal Husbandry
- Marketing and Agro-Processing

Suggested Matrix of Policy and Program Priorities. Table 25 provides a summary of the report's conclusions in a form of the programs and policies needed to operationalize its recommendations. The main issues that need to be tackled to achieve increases in animal productivity are disease control, animal nutrition (pasture management and winter feed), farmer know-how and marketing and agro-processing. Addressing these constraints, rather than increasing animal numbers or changing the genetic composition of the national herd, is the key to raising output from the livestock sector. Implemented successfully, these programs and policies will facilitate continued growth of the livestock sector and further the sector's contribution to economic growth and poverty reduction.

The groupings of the recommendations are not arranged in order of priority, because all aspects of livestock production have to improve simultaneously to obtain the maximum results. Improvement of livestock productivity should be a combined result of improvements in animal health, nutritional status, the general care and marketing infrastructure. Better nourished and well kept animals are less susceptible to diseases. Animals in optimal health condition produce more - bringing in more income with which nutrition and housing/care can be improved further. More efficient markets will translate increased productivity into higher farm incomes.

Chapter 8

Current and future agenda for action

The outlook for growth and modernization of the livestock sector is promising. Public and private sector leaders are keenly aware of the problems that need to be resolved, and are actively seeking solutions to these problems. The private sector is becoming more assertive and innovative, more willing to accept responsibility for roles traditionally performed by the state, and is building the capacity to assume these roles. There is also growing recognition of the beneficial role of rural communities in pasture management. Government is, thus, in a better position to focus its resources on the roles that it alone should perform, and to perform these roles more effectively. Continued domestic and regional economic growth, and the associated increase in demand for livestock products, further strengthens the platform for progress in the Kyrgyz livestock sector.

On June 15th, 2006, the World Bank organized a review and discussion of the recommendations of Livestock Sector Review in Bishkek to aid formulation of policy and program responses in the livestock sector. In general, there was overwhelming support for the report's diagnosis of the current situation of the livestock sector, and most stakeholders agreed with the technical findings of the report. Much of the discussion focused on what strategic actions needed to receive priority attention from the policy-makers. The Review was also widely understood to be an appropriate basis for discussions on how to channel scarce public funds to a few key areas of support. This is an important achievement, considering the number of key investment support requirements that have been identified by this analysis.

The objectives of this chapter are to document which policy and technical areas remain open on the livestock sector development agenda by each of the theme reviewed: animal health; pasture and nutrition and marketing and processing of livestock products. In the spirit of close stakeholder collaboration that was developed over the course of preparation of the Livestock Sector Review, several of these issues recount presentations made at the review and during the discussions. Looking ahead, it is clear that more time is needed to agree on these policy issues in detail. At the same time there is very little doubt, that success in implementation of such agreements will depend on clear division of public-private responsibilities as well as enumeration of areas where two sector need to collaborate.

I. Animal Health

As expected, the respective public-private roles and responsibilities in various aspects of animal health care were (and in the near future will continue to be) a subject of heated debate. There has, however, been relatively little debate about the need of the public sector to conduct border control to guard against an outside infection more effectively. Similarly, private sector stakeholders argued that, while at present, the control and monitoring of food safety issues has been widely believed to belong to the public domain, the responsibility of monitoring compliance with the national legislation could be shared with the private sector. Furthermore it was argued that the supply of both veterinary services (prophylactics and treatment) and drugs and vaccines should become an exclusive responsibility of the private sector because commercial initiative and dynamic will make veterinary services more effective and responsive.

Box 5: How do I see the future for the veterinary services?

“After carefully reading Chapter 4 “Animal and Human Health” of the Livestock Sector Development Project in Kyrgyz Republic, which was proposed for discussion, I came to the conclusion that: overall this section covered a whole range of veterinary issues and proposed adequate ways and actions for their solution. I wholeheartedly support measures proposed by the authors of the review: to reform veterinary legislation and bring it in line with emerging market relations and today’s requirements; reform veterinary services; broaden the rights and responsibilities of the Professional Association of Private Veterinarians and Veterinary Practitioners and delegate to it the function to issue certificates; create Veterinary Militia; streamline and control imported veterinary drugs, etc.

However, I think that several proposed actions seem to be fragmented, need to be deepened and have more constructive ways to address the issues.

I’ll start with the main point - legal framework. In paragraph 4.54, Chapter 4 there is a fair comment that a recently adopted Veterinary Law essentially perpetuates the traditional “command” approach and places onerous restrictions on private veterinary practice with no account of its interests. This is understandable – the draft law was developed “behind the scenes” at the State Veterinary Department (SVD), and its authors, so to speak, “pulled the blanket on themselves”. As a result, the public veterinary service has taken upon itself responsibilities that considerably exceed the realistic functions and responsibilities of a public veterinary service, and a private veterinary service has been assigned the function of “being at its beck and call”.

Meanwhile, the Initiative Group, which I participated in, prepared an alternative draft veterinary law on the basis of the world practices, market realities and active role of private veterinary services in prevention medicine, and submitted it to the government and the parliament. Paragraph 42, Chapter VII “Veterinary Medical Practices” provided for the establishment of a National Veterinary Council. The Council, which included private veterinary practitioners, key veterinary researchers, representatives of the state veterinary supervision agencies, was supposed to be elected during the assembly of the Kyrgyz Veterinary Congress.”

“.....In my view, it is necessary to substantially expand and elaborate paragraph 4.57, Chapter IV “Education and Information”. These two factors are crucial to the status of the veterinarian practice. It is no secret that veterinary specialists, isolated from the rest of the world, have no knowledge of new veterinary drugs and treatment techniques. They use obsolete methods and techniques which are not effective enough. In this situation, I think, it is necessary to create a national extension (training and advisory) and diagnostic center with its raion level branches. These centers should provide continuous education and training workshops for private veterinarians and practitioners so that they can renew their knowledge and learn new prevention and treatment methods and techniques”.

“.....It would make a lot of sense to supplement the extension (training and advisory) and diagnostic center with a mobile express diagnostic laboratory. In the event of a disease outbreak or its symptoms these on-call mobile labs would arrive on site, do research, make a diagnosis and propose effective treatment methods. It would also make sense to open a drug store at the Center so that it could provide centralized procurement of veterinary drugs from manufacturing companies and supply these drugs to private veterinarians. There is no secret that today veterinary drugs and vaccines are supplied by informal agents, handled and stored without any rules, and as a result could rather harm than treat animals”.

- Workshop participant.

Regarding the areas of joint public-private responsibilities it appears that there is an emerging consensus for the need of combining efforts in the areas of registration and licensing of veterinary drugs and vaccines and training of veterinarians. Participants agreed that the starting point in improving animal health care situation would involve both clearly elaborated legislation and the restructuring of the current animal health care system. As a next step, a program of investments of interventions supporting this restructuring effort will need to be put in place. These and other issues are now being studied under the framework of Avian Influenza Control and Human Pandemic Preparedness and Response Project.

II. Pasture and Animal Fodder Management

A large number of difficult policy alternatives still need to be reviewed and debated to find a solution that brings maximum benefit for Kyrgyzstan. It appears that, given apparently very strong interest of all stakeholders, pilot programs already in place (or soon to be in place) could be a very strong platform for finding a solution which would be in Kyrgyzstan's best interests. Given the complexity of the situation, any such solution should be suitable to unique characteristics that exist in the country and, accordingly, should be tried on a pilot basis before its nationwide roll-out. At the same time, policy decisions could be initiated in the following areas on the basis of a review the best international practices and experience:

Pasture management responsibility. It was widely believed that the establishment of pasture associations or committees, that would collect rents for leasing and decide on retention of a certain proportion of the money to improve or maintain pastures, would be a suitable alternative to the present system. Concerns were nonetheless raised that a technology deficit needed to be addressed in parallel. There is also a need to decide if responsibility for pasture management, and improvement, should be controlled by individuals or be a communal responsibility.

Simplification of administration and inspection. The present administration of the various aspects of land use is very complex and needs to be simplified. Decision is required whether to retain or reduce the number of agencies involved. At present some of them pass on their duties to others and as indicated during the discussions there is little confidence among farmers that the present system is effective.

Rent collection. There was widespread skepticism among farmer that all of the rent paid is accurately recorded and accounted for. Some participants noted that pasture associations or committees would overcome these problems and result in much needed improvements in pasture productivity.

Lack of boundaries. It was emphasized that boundaries between different areas should be identified and mapped. This was regarded as essential to the administration and smooth running of grazing management programs and the avoidance of disagreements between farmers. No controlled grazing can be implemented when farmers have not a clear knowledge of boundaries of the areas allocated to them for grazing. The present situation can often lead to undesirable misunderstandings.

Provision of routes for transfer of animals to distant pastures. Among other major obstacles to improved pasture use was the lack of access to distant summer pastures which are now grossly underutilized. The provision of mapped routes along which animals can be transferred was considered to be essential.

Pasture inventory by geographic areas. This is viewed as a fundamental requirement on which to base pasture allocation. Mapping of pastures indicating their relative grazing capabilities would facilitate more equitable and enlightened assessment by administrators

Beginning in January 2007 the USAID Land Reform and Market Development Project, implemented by Chemonics International Inc., began a legal and institutional review related to

pasture use and management. This review is done in coordination with the World Bank and the World Bank funded Agriculture Support Services Project. In addition, the Project will actively participate in future legislative drafting and in other activities needed for sustainable pasture management practices some of which are already being piloted under ASSP and will be expanded by the World Bank's new Agriculture and Livestock Support Project.

III. Marketing and agro-processing

It was clear that the size of the domestic market does not pose a constraint to the successful development of the Kyrgyz livestock sector and its processing enterprises. Kyrgyz producers can utilize their comparative advantages (such as natural and climatic conditions) to successfully compete against increasing imports and the industrial centers of its neighboring countries offer stable export markets.

Box 6: Major Issues and Marketing of Kyrgyz Livestock Products

To start up market mechanisms in the livestock sector and to restore achievements of Kyrgyzstan in the area of livestock products sales at least on the regional level, in our view, it would be necessary to undertake the following major actions:

First, it is necessary to create several basic farms – “livestock schools” - in oblasts to show farmers on a concrete example that livestock production may be a lucrative commercial business.

Second, it is necessary to make adjustments in the tax legislation in terms of making processing industries exempt from additional VAT for agricultural producers and farmers so that the processing enterprises had an incentive to make official purchases of primary material from farmers and to produce competitive products.

Third, it is necessary to encourage the formation of trading and purchasing companies which on a regular basis provide procurement, sorting/grading of produce, its preparation for export shipments and for processing enterprises. Such companies should have all the required logistics and infrastructure to arrange these shipments.

Fourth, it is necessary to finalize the existing legal framework in order to simplify land and collateral transactions, and to provide farmers access to cheap financial lending and opportunity to use leasing operations. To enact effective laws on leasing and pastures and introduce realistic mechanisms of their implementation.

Fifth, using donor funds it is necessary to implement a complex of training activities for farmers on the issues of introducing world wide common practices in the livestock sector: TRACING system and ISO standards, including product certification system.

Sixth, donor organization working in Kyrgyz Republic should encourage the formation of social livestock farmers associations to strengthening their bargaining position and to develop efficient mechanisms to protect the domestic market against counterfeited products.

- *Workshop participant.*

There was little debate that the majority of animal holders did not run their farms on a commercial basis and thus they (as opposed to more commercially-minded units) could not take advantage of a recent growth in prices for major food products. At the same time it was agreed that all types of farms experienced a number of key constraints to their successful operation.

Because farmers lack special knowledge in basic business and livestock management they achieve low animal productivity (very low weight gain, longer rearing period and low milk yields), largely because farmers do not arrange proper animal nutrition. It was also noted that

Kyrgyz farmers were not using any quality standards for livestock commodities. Also, discussions took place about policy errors related to introduction of VAT for farmers which resulted in further farm fragmentation. The consequent elimination of VAT in 2005 had eased the situation for farmers, but the burden of debt has been fully (and unfairly) transferred to the processing sector, which has compromised its revival since then. Many noted broader problems related to the flaws in land and collateral/mortgage laws that do not allow farmers to pledge their assets in order to receive loans and to develop their operations.

Table 24: Summary findings and suggested action plan

<i>Improving Livestock Performance</i>		
<i>Diagnosis</i>	<i>Constraints</i>	<i>Suggested Policy and Investment Programs and Responses</i>
<p>The current breeds are expressing about half of their genetic potential. Realistic targets for increased production can be set for:</p> <p>Milk – 70%; Beef – over 50% Lamb – over 50%</p>	<ul style="list-style-type: none"> • Poor farmer knowledge of animal nutrition and good agricultural practices. • Poor nutrition leading to low milk yield per cow and poor animal growth rates. There are problems with quality and quantity of animal feed, in part because of poor access to pastures. • Poor fertility leading to a large number of cows/ewes not calving/lambing down annually. Abortions brought about by diseases such as brucellosis and poor nutrition. • High mortality rates in calves/lambs due to diseases, inadequate nutrition and management problems; 	<ul style="list-style-type: none"> • Expand farm extension activities directed at small-scale livestock production and to the specific problems faced by livestock producers. (partial coverage under the Agricultural Services Support Project) • Strength public, private and community veterinary systems and create more effective partnership between them. (see detailed description under “Animal Health”) • Develop an effective local governance of pasture resources to ensure that they lead to more effective use of communal and government-owned grazing lands. (see detailed description under “Pasture Management”) • Review the relevance the rapid increase in public support for animal breeding programs.

<i>Improving Animal Health</i>		
<i>Diagnosis</i>	<i>Constraints</i>	<i>Suggested Policy and Investment Programs and Responses</i>
Animal health is a very serious problem and there is evidence that the situation is deteriorating still further. Brucellosis, Foot and Mouth Disease, anthrax, rabies and echinococcus are common and the transfer of these diseases to humans is widespread.	<ul style="list-style-type: none"> • Traditional approach and methodology to veterinary health care is no longer appropriate for the current production system. • Inadequate facilitation of private veterinary practice. • Deficient diagnostic and monitoring systems; • Producers are reluctant to co-operate for the fear of not receiving adequate compensation for animals that have to be destroyed and possibility of fines. • Under funding for recurrent expenses and backlog of capital investments. • Inadequate knowledge of modern veterinary practices and risk management techniques. • Slow and expensive registration of drugs and vaccines 	<ul style="list-style-type: none"> • Perform a structural review and redesign the veterinary services according to new needs and requirements (on-going under the Avian Influenza Control Project). • Develop an updated policy and strategy for the development of the veterinary services. (on-going under the Avian Influenza Control Project). • Develop a model for public-private collaboration with mechanisms for contracting, monitoring and supervision. (on-going under the Avian Influenza Control Project) • Develop a phased privatization plan of veterinary post and veterinary practice in the country in coordination with the organization of private veterinarians; • Develop and conduct a training program to update private veterinarians' knowledge and skills; • Assist in the development of a professional veterinary organization that will take responsibility for registration and licensing of private veterinarians, joint monitoring of

		<p>quality of work with the State Veterinary Department and maintaining professional and ethical standards.</p> <ul style="list-style-type: none"> • Increase farmer incentive to participate in control and vaccination programs by providing free vaccinations (brucellosis) and by paying adequate compensation for animals that have to be destroyed. Where appropriate, donor support should be obtained to help fund such compensation programs. • Improve the efficiency and cost-effectiveness of the national laboratory system, through the installation of more modern laboratory equipment and communication systems, coupled with appropriate upgrading of staff skills. The national laboratory network should also be rationalized, with full-fledged laboratories operating at the national and regional levels only, while smaller facilities for routine tasks should be divested to private owner-operators who would charge fees for their services. (partially covered under on-going under the Avian Influenza Control Project) • Develop better registration system of imported drugs and vaccines.
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<i>Sustainable Management of Pastures</i>		
<i>Diagnosis</i>	<i>Constraints</i>	<i>Suggested Policy and Investment Programs and Responses</i>
Significant decline in pasture productivity (ranging from 33% growth in the degraded areas of winter pastures to 60% growth in the degraded area for spring-autumn pastures since independence) represents a growing constraint on the livestock sector growth.	<ul style="list-style-type: none"> • Lack of structured use of pastures. Pasture usage has reverted to old tribal methods, but without the elements of transhumance that supports rational use of resources. • Widespread avoidance of registering grazing rights • Allocation of grazing rights and payment methods are opaque and do not promote sustainable pasture use. • Little capacity for technical support in sustainable management of pastures 	<ul style="list-style-type: none"> • Amend legislation to permit consolidation of pasture management under rural municipalities. This will involve amendments to the Land Code, Forestry Code, the Law on Local Self Government and Local State Administration, Law on Management of Agricultural Land, Tax Code, and other legislation. • Undertake large scale training and technical assistance for the transition to rural municipality consolidated management of pastures. This will involve capacity building to develop pasture management plans and monitoring measures that are simple enough to be practically applied, while allowing for sustainable use and rehabilitation of rangeland. • Improve technical capacity at the national and regional levels to support decentralized pasture management. Technical expertise must be fostered at the national and regional levels in order to provide long term planning for sustainable pasture use across the country. • Increase public awareness and promote social mobilization. Information

		<p>dissemination should be part of a broader program to mobilize rural citizenry to take a stake in the management of their local pasture resources.</p> <ul style="list-style-type: none"> • Develop a grant mechanism for local infrastructure improvements. A grant mechanism involving at cash or in-kind community contribution for priority investments will alleviate some of the physical challenges to better use of available pasture resources and promote involvement of herders. • Promote pilots to study the consequences and mechanisms needed to transfer management to rural municipalities as well as foster greater community involvement in decision making.
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<i>Efficient Markets</i>		
<i>Diagnosis</i>	<i>Constraints</i>	<i>Suggested Policy and Investment Programs and Responses</i>
<p>Demand analyses suggest that growing demand has exceeded the capacity of producers to respond by increasing supply. Slow supply side response therefore appears to be a much more limiting constraint to livestock sector growth than demand side constraints. However, the immediate challenge for the domestic livestock producers will be to maintain its share of domestic markets in the face of increasing competition from imports.</p>	<ul style="list-style-type: none"> • The prevalence of outmoded business practices poses a threat to the medium- to long-term sustainability of agro-processing industry. • The procedures to enable exports are very difficult to execute at the border crossings, including factual inability to reclaim VAT on exports. • Ineffective registration and licensing of businesses involved in foodstuff production. • Fragmented nature of primary production makes it difficult to secure sufficient supplies for agro processors. • Harmonization of the domestic and international food safety principles and standards is not yet complete. • Available leasing and working capital finance packages are not attractive. 	<ul style="list-style-type: none"> • Support to facilitation of marketing groups and association. These organizations must be based on producer demand and centered on a product nexus. Other support services – such as off take contracts with traders or processors, market infrastructure, and business service development -- can then be delivered much more efficiently. • Encourage streamlining of application and documentation requirements and easing of the banks' collateral policies for facilitating credit. Many of the issues that concern risk and collateral would benefit from a reform of enforcement regulations and the widespread use of commercial arbitration courts. • Exempt leasing packages from VAT on capital fund investments that will enable processors to replace outdated equipment. • Financial and technical support for bringing domestic legislation and regulations in compliance with WTO requirements. This involves, inter alia, establishing a reference laboratory for food technical standards and to have it registered

		<p>and accredited with the requisite international organizations.</p> <ul style="list-style-type: none"> • Provide matching grants to finance construction of marketing infrastructure (slaughterhouses and cold storage facilities). The provision of such grants should be conditioned upon the facility being certified as complying with the relevant international standards (e.g., HACCP, ISO, etc.). • Undertake Trade Promotion campaigns. Initial campaigns should be directed at traditional markets in Russia and Central Asia, and they should be coordinated with members of the private sector who are in a position to follow up with actual business transactions.
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