

Feasibility and implementation strategies of dairy extension in Ulaanbaatar/Mongolia

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Abstract

The consumption of dairy products in the Ulaanbaatar city was equivalent to 64 million liters of liquid milk in 2005 and is expected to reach 79 million liters by 2015, whereas local dairy farms supplied 12 million liters. The growth of the dairy market may also involve opportunities for extension work. This study analyses the current situation in the dairy sector and suggests extension strategies. Findings show that, if a commercial extension service is financed with a business loan at the usual interest of 24% p.a., it needs initial subsidizing to a net current value of \$71,126 for ten years.

Keywords: dairy farming, commodity-specific extension, user financing, farmer organization

Introduction

Privatization and commercialization are on the agenda of many extension services (Hoffmann et al. 2000, Rivera 2001). Some governments try to compromise between public and private interests by combining private delivery of agricultural extension with public funding (Kidd et al. 2000, Katz 2002). It has been frequently reported that not only governments, but also farmers tend to prefer private delivery of extension (Alex et al. 2002, Loolaid 2002, Proost and Duijsings 2003, Sulaiman 2003). Most publications, however, focus on changes of existing systems rather than on the establishment of new extension systems, whereas the latter case might be more relevant for transition countries.

In Mongolia, agriculture contributes for 21% of the GDP (National Statistical Office 2006). Having almost passed the transition to a market economy and attained a GDP-growth between six and eleven percent in the recent years, the country is a suitable place for investigating the possibility of establishing private extension in emerging economies. On the contrary to the traditionally established pastoral animal husbandry, the semi-intensive dairy farming around the Ulaanbaatar city promises both more demand on and a better ability to afford extension.

This paper analyses the current conditions in the dairy sector, characterizes the management of dairy farms and quantifies their economic performance. The knowledge of the situation is then used for elaborating strategies for dairy extension work, whereas the paper looks at the profitability of the farms on the one hand, and that of the extension service on the other. It was assumed that, even if service fees cannot fully cover the costs of extension work, there are possibilities to finance extension activities.

Material and methods

Ulaanbaatar is the capital of Mongolia and has a population of one million, which is 40% of the entire population. The city stands 1,350 meters above sea level and covers an area of 4,704 km². The air temperature fluctuates from -21.8°C in January to 16.9°C in July. The amount of precipitation is between 180 to 260 mm per year. The GDP per capita was \$1,271 while the national average was \$746 in 2005 (National Statistical Office 2006).

A field survey was carried out between March and June 2006. Analysis of secondary material, key informant interviews and farm visits were conducted in order i) to study the recent history of the dairy sector, ii) to quantify dairy farms in the area, iii) to characterize the business environment of dairy farming, and iv) to collect ideas of different stakeholders. The key informant interviews involved 26 persons including farmers, researchers, policy makers, local

authorities and NGO-representatives. Questionnaires were used for expert interviews and interview guidelines were used for farmer interviews. The sector analysis was completed by a detailed analysis of 30 dairy farms, which represent eight percent of the global number of dairy farms. The selection aimed to represent the actual structure of dairy farms in the area: the sample consisted of 14 small farms with less than 15 cows, 15 medium farms with 15 to 30 cows and one large farm with 73 cows. Two questionnaires were used for data collection: one for quantitative farm data and the other for qualitative information on farm management, perception of problems and outlooks for farm development.

Data evaluation involved descriptive statistics as the main approach. The profitability of dairy farming was investigated with gross margin calculations. The farm economy was characterized by the total gross margin, the farm income, and the management income as profitability measures, and the cash surplus as a measure of liquidity. The influence of farm size on the profitability was examined with a linear regression. The results of the sector analysis were used for elaboration of extension strategies. A multi-period investment appraisal was conducted to find out to what extent a commercial firm could finance extension activities.

Results of the situation analysis

The dairy sector in Ulaanbaatar seems to have recovered from the post-privatization crisis in the early 1990s and the stagnancy afterwards. This is indicated by the increase of dairy farms and the high level of contentment that the farmers have with their businesses. Some 420 dairy farms have been established between by 2005. While 52% of the farms have up to 10 cows, 33% have 10 to 20 cows and the remaining farms have more than 20, but usually less than 50 cows. The industrial milk production increased from 1.5 million liters in 2000 to 7.1 million liters in 2005 (National Statistical Office 2006). There is market potential for further growth of the sector. The increase of Ulaanbaatar's population boosts the dairy market. The total effective demand of milk and dairy products is expected to increase - expressed in raw milk amounts - from 64 million liters in 2005 to 79 million liters in 2015. If the current structure of milk suppliers persists, the farms can increase their production by three million liters until then (Tab. 1).

Table 1: Current structure of milk suppliers in Ulaanbaatar and the expected structure for 2015 at constant market shares and consumption level of 66 l raw milk per person

Suppliers	2005		2015	
	Market share	Supply, million liters of raw milk	Market share	Supply, million liters of raw milk
Farmers	19%	12	19%	15
Herders	53%	34	53%	42
Imports	28%	18 (equivalent)	28%	22 (equivalent)
Total	100%	64	100%	79

Source: National Statistical Office 2006

In a better scenario, the farms could also increase their market share. While imports are justified by the lack of domestic capacity to substitute, the farmers could share the herders' market share. By taking over a half of the herders' share, they could supply 36 million liters in 2015. The additional volume of 24 million liters allows 800 new farms with 15 cows the market entrance. Alternatively, the currently existing farms could double their production, and there would be still a market capacity for 400 new farms with 15 cows.

The sampled farms were family-run commercial farms specialized in dairy production. The semi-intensive farming system was characterized by a grazing season of 176 days per year. Grazing is free of charge. The average daily feed ration over the grazing season consisted of 11 kg dry matter (DM) of pasture grass and 1.2 kg DM of bran while the average ration during the stall period consisted of eight kg DM of hay and 2.3 kg DM of bran. The dairy herds were

dominated by the breeds 'Black and White' and 'Alatau'. Twenty percent of the farmers inseminated their cows artificially while the remaining farmers applied natural insemination in 2005. Most cows delivered between March and May.

Major parameters characterizing the farms are summarized in Tab. 2 and reveal their competitiveness. Converted to a month's salary of \$180, the return to unpaid labor is 114% higher than the average salary in Mongolia. The return to the equity capital is 40%, and 22% higher than the average interest of saving accounts. However, there are substantial differences between the farms in functional parameters as well as in their economic performance. More intensified farms are more productive and profitable. Simple quantitative indicators of intensification are the duration of the grazing season and feed rations. Qualitative indicators include breed, barn comfort, properness of insemination, and quality of inputs.

Table 2: Dairy farm characteristics in the Ulaanbaatar area (N=30)

Parameters	Unit	Mean	Min.	Max.
<i>Farm parameters</i>				
Number of cows	N	16	3	73
Capital intensity per cow	\$/year	479	364	907
Labor input per cow	man hour/year	357	179	1,497
Duration of the grazing season	days/year	176	139	244
Dry matter supply	Kg/year	4,063	3,667	4,753
Energy supply	MJ NEL/year	19,991	17,938	23,290
Protein supply	Kg nXP/year	443	395	518
Lactation yield per cow	Liter/year	2,460	1,845	3,090
Total milk production	Liter/year	37,213	5,895	173,950
<i>Profitability</i>				
Gross margin per cow	\$/year	383	196	644
Total gross margin	\$/year	6,438	738	21,797
Farm income	\$/year	4,658	613	15,166
Return to unpaid family labor forces	\$/man hour	0.9	-0.4	2.6
Return to equity capital	%	40	-84%	240%
Management income	\$/year	1,997	-1,569	10,418
<i>Liquidity</i>				
Consumable income	\$/year	5,176	1,230	16,534
Cash surplus	\$/year	2,582	-810	13,500

Larger farms tend to be more intensified, thus more profitable than smaller farms. They have not only better possibilities to optimize their production systems and to bear risks, but also better intellectual capacities and higher motivation. Hence, we should conclude that successful farms are large and not that large farms are successful. The following linear regression applies to the dependence of the management income on the farm size: $y = 144x - 338^*$

y – Management income, \$ per year

x – Number of cows, n

* – Significant at the 0.01 level.

The following major problems were identified: i) lack of credits, ii) lack of feedstuffs, iii) overgrazing, and iv) deterioration of the cattle breeds. Development plans of the farmers included fodder cropping, expansion of the dairy herd and on-farm milk processing. Individual plans also included moving to a less intensively grazed area, fattening of male calves and mechanization.

Discussion of strategies for dairy extension work

Dairy extension should help the farmers make right decisions by informing and motivating. Farm consultancy measures should aim at breeding, feeding, barn comfort, on-farm milk processing, and farm management. Right solutions will always depend on the size, the level of intensification, the capacity to bear risks and the entrepreneurship skills of the farmers. Emphasis should be laid on intensification e.g. through an intensive use of AI, and on supporting the farmers in trying out new possibilities such as fodder cropping, cattle breeding or fattening of male calves.

Farm consultancy should use a mix of extension methods. Mass extension methods are appropriate for informing while group discussions for elaborating development proposals and projects. Trainings will be preferred to individual advising due to lower costs. Even if it is only affordable for larger farmers, individual extension is necessary for some services e.g. advising on farm economy and business plan service.

Advising/training measures, however, will yield limited results if the business environment of the farms will not improve. Thus, dairy extension has to extend its view of target groups: these include not only farmers but also other stakeholders, especially service providers. As a facilitator, the dairy extension service will primarily focus on promotion of AI services and facilitation of financial services. Two approaches to improve the availability of credits can be raised for discussion: acceptance of future milk production as collateral, and promotion of supplier and buyer credits.

The extension tasks and activities described above need funding. Full cost-recovery may be only possible for individual services targeted at large farms. In addition, as long as extension impacts are limited by the unfavorable business environment, the farmers would not accept full cost-recovery. Thus, a dairy extension service should generate incomes otherwise and invest a part of these incomes into its core extension activities. Most feasible income-generating activities include establishment of a financial service and feed trade. A sale-and-lease scheme seems to be an appropriate form of financial service. In this scheme, the farmers sell cows to the extension service and lease them back i.e. the cows remain at their farms. The farmers bear the risk of cow losses, and compensate with another cow if a leased cow dies. Feed trade requires investment into local storehouses, but the investment is justified since considerable amounts of cash will flow to the extension service, and no longer to feed traders.

A further essential function of dairy extension is organizational development. An effective way to get farmers organized may be to set a single target, which should meet the interests of many farmers, promise high returns to their financial participation, and, ideally, suit to the interests of other stakeholders. The establishment of milk collection centers in places with dairy farmers may fulfill these requirements. It would enable the dairies to contract a single partner and thus, to reduce their transaction costs. The incentive for the farmers is to reduce transport costs and the risk of milk spoilage. Since the milk collection centers will be equipped with milk cooling tanks the farmers will not need coolers or freezers anymore. The idea may also attract farmers because the cooperative milk collection can become the first step to the realization of their plan to set up cooperative milk processing plants.

In its pilot phase, the dairy extension service is assumed to serve 50% of the potential clientele i.e. 207 farms with 2,615 cows. The organization should consist of a head office in the city and local branches in the villages 'Gachuurt' and 'Jargalant', and employ five advisors in addition to a manager and a secretary. If we assume that the client farmers purchase 50% of their total hay provision and all bran they need, three storehouses (one in each location) with a total volume for 1,650 t hay and 800 t bran will be required. The investment into the storehouses was estimated at \$16,000 and the total budget for facilities and equipment is \$29,000. Operational costs of the service without extension activities are \$209,206, and include the initial financing of the loan service and the feed trade, salaries, rents, overheads, variable costs of vehicles and costs of feed storage. Revenues will be generated by the leasing service and feed sales. The rate

of the leasing was set at 30% p.a., which is 6% lower than the average interest of smaller bank loans. In this case, the payments of the farmers include the loan repayment of \$69,200 and a total of \$20,760 for the interest. The revenue of the feed trade is \$135,408 per year.

The investment appraisal reveals that the leasing service and feed trade are profitable. Even by being financed by a business loan with the usual interest of 24% p.a. the project is able to yield surpluses to a net current value of 40,152 (Tab. 3).

Table 3: Results of the multi-period investment appraisal of the suggested pilot project at different rates of interest for the credit financing (without extension activities yet)

Positions	Unit	Interest rate of the loan		
		12% p.a.	18% p.a.	24% p.a.
Credit volume	\$	238,206	238,206	238,206
Term	year	10	10	10
Assumed inflation	%	5	5	5
Outcomes:				
Benefit-Cost Ratio	\$	1.05	1.04	1.03
Net current value of the investment	\$	82,574	57,311	40,152

In order to conduct extension activities, the project needs three more cars, and \$20,700 per year (at approx. \$100 per client farmer) for financing extension activities. If we assume that service fees cover 25% of the costs, the current value of the extension costs over ten years is \$111,277. This is more than the amount the project could afford, which is \$82,574 if the project is financed with a soft loan, and \$40,152 if the project is financed with a business loan. The proposed project will, if it is financed with a business loan, need a subsidy of \$71,126 in order to sustain the extension service at the annual budget of \$100 per farmer for ten years. More would be needed if the suggested budget would be insufficient.

Concluding remarks

A commercial dairy extension service should focus on income-generating activities first. Leasing service and feed trade are feasible and profitable options for the extension service, and they have also been required by the farmers. One might wonder if extension activities are necessary at all if a commercial organization does already make profits with these services. This is a short-sighted view: only if the farmers are able to use the inputs best, they will increase their income and pay more. The integrated concept of extension and input supply is based on a fair relationship of giving and taking.

Unfortunately, even a combination of multiple income sources does not enable a dairy extension service to finance its core activities without external funding. Thus, initial subsidizing is necessary. But that does not mean that the subsidy is not paid back, nor does that indicate long-term dependence on subsidies. The future development of the sector will lead to an increasing competition of the farms, in which those with a knowledge-based management will survive. When the value of knowledge attains a level, on which dairy extension is financially self-sustaining, the extension service will be able to release itself from other tasks and to focus on non-material forms of assistance. The delivery of agribusiness services, but also that of the core extension activities should be gradually shifted to farmer organizations. Eventually, the extension service itself can be owned by a farmer organization or dissolved.

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