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SMALLHOLDER DAIRY PROJECT

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SDP Policy Brief 3

Competitiveness of the Smallholder Dairy Enterprise in Kenya

Key points

- The smallholder dairy enterprise in Kenya is competitive and returns good profits across all production systems, and can provide remunerative employment when off-farm employment is scarce. Non-marketed benefits can augment these returns.
- The cost of milk production rises as systems become more intensive.
- Poor infrastructure is a major constraint on production, significantly reducing farm-gate prices and raising the cost of inputs and services.
- Policies that target improvement of road infrastructure and monitoring of feed quality are likely to have a positive and significant effect on dairying in the country.
- Formal market outlets provide more uniform prices, and encourage scaling up.

Introduction

The dairy industry forms a significant part of the rural economy in Kenya, accounting for 14 percent of agricultural gross domestic product (GDP) as well as being a primary source of livelihood for many smallholders,[1] who account for over 70 percent of total marketed milk in the country (box 1).

This brief attempts to assess the profitability and competitiveness of the smallholder dairy enterprise in Kenya by comparing costs to income in the industry, based on a study by the Smallholder Dairy Project (SDP) of farms in three locations (box 2). Such estimates have not previously been readily available, but are important for policymakers and development planners when prioritizing dairy development needs and policies. This is especially true since liberalization of the dairy industry and reduced public support has altered milk market structures and potentially the relative prices of inputs and outputs.

This brief also explores the issue of non-marketed benefits and presents some results from a survey. Less emphasis has been placed on such benefits, mainly because they are difficult to evaluate. However, non-marketed benefits from keeping livestock are substantial.

Determinants of milk prices

The profitability of the dairy enterprise depends on the relationship between the costs of inputs and the price of milk offered in the market. The market price reflects interactions of supply, demand, and policy factors. Factors that may affect milk prices include:

- Fluctuations in supply may result from seasonal variations in milk production.

Box 1.
Smallholder dairy production systems

Smallholder dairy production systems range from stall-fed cut-and-carry systems, supplemented with purchased concentrate feed in high human population density areas, to free grazing on unimproved natural pasture in the more marginal areas. Upgraded dairy breeds tend to be kept in stall-feeding units; cross-bred cattle in semi-zero-grazing systems; and zebu cattle in free-grazing systems. The production systems are influenced by the agroclimatic characteristics of the area and by prevalence of animal diseases.

Box 2.
Data sources and methods

Accurate data were obtained using detailed surveys of representative dairy farms in Kiambu, Nakuru, and Nyandarua Districts of Central Province.[2] A total of 21 farm households were surveyed in Kiambu, and 11 each in Nakuru and Nyandarua Districts, between October 1997 and March 2000. Each farm was visited twice weekly over 14 months to obtain daily records of inputs, outputs, purchases, and sales, resulting in a total of over 3,500 farm observations. The smallholdings surveyed specialized in dairying, with some income from cropping. Kiambu represents the most-intensive dairy production system, with good agroclimatic potential and good market access because of its proximity to Nairobi. Nakuru follows Kiambu in terms of production intensity, medium agroclimatic potential, and medium market access. Nyandarua represents the least-intensive production system with good agroclimatic potential but poor market access due to long distances and poor condition of roads. Budget analysis was used to estimate the cost of production in each area.

- Road infrastructure also plays a key role, especially in the informal market that dominates the dairy subsector. For instance, farmers 75 kilometres or more from Nairobi may get 22 percent less for their milk than farmers close to the urban areas. Additional analyses indicate that each additional kilometre of poor feeder road that separates a farm from the main road reduces the milk price by some 0.5 shillings per litre, or about 3 percent per kilometre.
- Competition from milk powder imports has been blamed for falling producer milk prices, particularly in some major milk-producing areas in the country. However, while it is true that Kenya has been a net importer of milk (especially in powder form) since 1997, these imports have been minimal compared with national production, which has risen considerably over the same period (Figure 1). It seems unlikely, therefore, that such imports are significantly contributing to low farm-gate prices for milk.

Cost of milk production

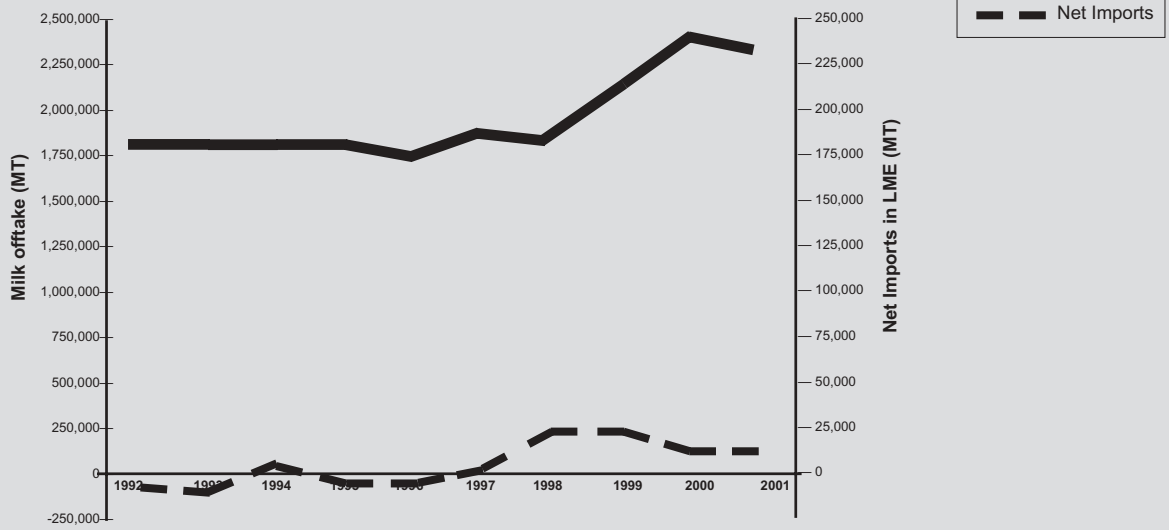
Table 1 shows costs, income, and profitability of the three surveyed locations. The cost of milk production rises as systems become more intensive. Kiambu, the most intensive, has the highest cost of production at Ksh 17.2/litre, while Nyandarua is the least intensive with costs of Ksh 11.9/litre. Market price for milk is highest in Kiambu, due to its proximity to the large demand centre of Nairobi,[3] and lowest in Nyandarua. Revenue per litre includes sales of culled cattle, so revenue is higher than price per litre.

Figure 2 shows the principal cost components and profit received for each location. The main cost items in smallholder systems are fixed costs, veterinary services, feedstuffs, and labour. The main characteristic revealed is the increasing expenditure per litre on concentrates and forages as systems become more intensive.

The dairy enterprise returns above-normal profits[4] across the systems with highest returns realized in the least-intensive system, Nyandarua, and lowest in the medium-intensive system, Nakuru District. This indicates that the smallholder dairy enterprise is competitive relative to other alternative enterprises. These returns would be even higher with inclusion of non-marketed benefits to the smallholder dairy enterprise (see next section).

On average, gross margin from the dairy enterprise was estimated at Ksh 38,700 or about US$ 500 per household per year. This is an important addition to household income. From the SDP's studies in Kiambu, Nakuru, and Nyandarua, it was estimated that 76 percent, 78 percent, and 63 percent respectively of the total farm gross margin was contributed by dairying. The rest was contributed by crop enterprises.

Figure 1. Total milk offtake and net imports for Kenya, 1992-2001 [5]



Non-marketed benefits in dairy cattle keeping

Besides the marketed output from the dairy enterprise, such as milk and sale of cull animals, there are other non-marketed benefits that, when considered together, augment the competitiveness of small livestock producers. Examples of non-marketed benefits are primarily:

- The value of manure used on farm
- The function of livestock as security against contingencies
- The function of livestock as a means of financing periodic expenditures such as school fees

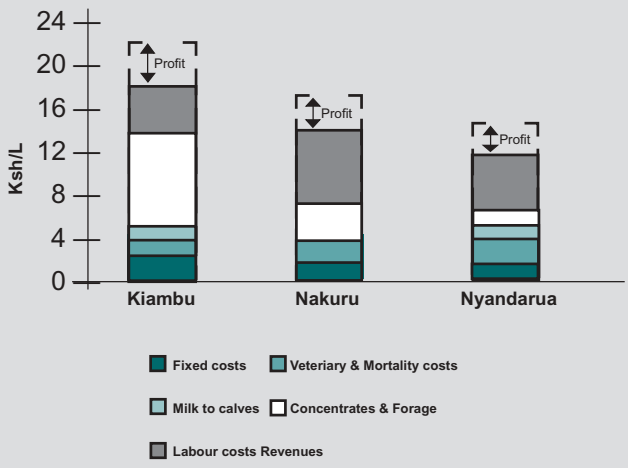
In addition, cattle are also important in display of status. In a survey carried out in Kenya of 250 cattle-keeping households in three cattle-keeping systems-intensive, semi-intensive, and extensive-it was estimated that non-marketed benefits account for approximately 20 percent of the animal's total value across the three systems.[6]

However, these non-marketed benefits may not be realized in large-scale systems, as manure may be associated with disposal costs and cattle considered as tied-up capital rather than stored assets.

Table 1. Comparison of average costs of milk production, price received, revenue, and profit across the three study sites

Ksh	Kiambu (1998)	Nakuru (2000)	Nyandarua (2000)
Cost per litre	17.20	13.28	11.93
Price per litre	17.63	15.19	14.30
Revenue per litre	21.29	16.88	16.68
Profit (Ksh/litre)	4.09	3.60	4.75

Figure 2. Cost components and profit for selected dairy enterprises (Ksh/litre)



Conclusions

The following primary conclusions can be drawn from this study of the smallholder dairy enterprise in Kenya:

- Smallholder dairy production is profitable in a variety of systems and settings. In addition, cattle keeping has a number of non-marketed and social benefits.
- However, the industry is hampered a number of constraints. For example, sales and profitability would increase considerably if farmers had better access to markets and to quality feedstuffs.

Policy implications

The most important policy implication is that the smallholder dairy system is profitable under current conditions, which is the likely driving force behind its huge success in Kenya. The dairy sector thus continues to be an important area for public and donor investment for income and employment generation.

Several specific policy themes could have a major positive impact on smallholder dairying cost structure and profitability:[7]

Road infrastructure has an important influence on the returns to smallholder dairy production, even more so in the informal market that dominates the dairy sector. Farmers far from large demand centres often get less return for their milk than those close to large demand centres. Therefore, policies that target improvement of road infrastructure are likely to have a positive and significant effect on the livelihoods of dairy farmers.

Livestock feeds form major cost items in the smallholder dairy enterprise. However, concerns over high feed prices and poor quality have continually been raised after liberalization of the feeds market and decontrol of feed prices. Some of the necessary ingredients, especially those not locally available, are in low supply. Policy guideline and effective regulations to ensure supply of standardized quality feeds would improve farmer competitiveness.

The formal processed milk market, including cooperatives and private processors was found to offer a more stable price environment and incentives for larger-scale dairy production. In the longer term, therefore, development of the formal marketing sector will likely provide a positive environment for general growth in the industry, and for opportunities for smallholders to increase scale of production. Opportunties in the formal market will however depend in turn on growth in consumer demand for formally processed products.[8]

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[1] See brief 2, 'Employment Generation in the Kenya Dairy Industry'; and brief 5, 'Improved Child Nutrition through Cattle Ownership in Kenya'.

[2] Staal, S.J., Waithaka, M., Njoroge, L., Mwangi, D.M., Njubi, D., and Wokabi, A. 2003. 'Costs of Milk Production in Kenya: Estimates from Kiambu, Nakuru and Nyandarua Districts.' SDP Collaborative Research Report.

[3] See brief 1, 'The Demand for Dairy Products in Kenya'.

[4] Above-normal profits are considered to be those which accrue after the full costs of family labour are deducted.

[5] Milk offtake is equal to total production less calf consumption (15 percent of production); a factor of 9 was used to convert dry milk imports to liquid milk equivalent (LME).

[6] Source: Ouma et al 2003.

[7] See brief 6, 'The Policy Environment of Kenya's Dairy Sector'.

[8] See brief 1, "Demand for Dairy Products in Kenya"

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