

Policy Brief

Productivity Trends and Performance of Dairy Farming in Kenya

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This study examined trends in milk productivity and performance of the Kenyan smallholder dairy sector using a nationwide representative panel household data (2000-2010) and cross-sectional data collected in 2010 in the major milk producing areas. Descriptive statistics and gross margin analysis of the dairy enterprise were used to examine the performance of the dairy sector between zero- and non-zero grazing systems, and across different milk sheds. The findings of the study showed a positive trend in milk productivity between 2000 and 2010. However, productivity was higher in higher potential areas and increased up the income quintiles, suggesting that dairy farming could be a preserve of the relatively better off households. Gross margin analysis showed that dairying is an economically viable enterprise in the short-run, with the non-zero grazing system having higher gross margins and therefore, a financial advantage. However, an example of zero-grazing for farmers selling milk through the Githunguri farmers' cooperative society indicated that zero-grazing dairying can perform well under conditions of collective marketing, good linkage to markets in terms of processing, access to production information, credit as well as other benefits. Greater commercialization of the dairy sub-sector and an increase in smallholder incomes will come from improved technologies that will make the existing resources more productive, as well as policies and actions that will deal with the seasonal intra-year variations in production which include creation of a strategic milk reserve, investment in processing of long life dairy products and investment in infrastructure such as roads and electricity.

BACKGROUND: Kenya's dairy industry is dynamic and plays an important economic and nutrition role in the lives of many people ranging from farmers to milk hawkers, processors, and consumers. Kenya has one of the largest dairy industries in sub-Saharan Africa. The industry contributes 14 percent of agricultural GDP and 3.5 percent of total GDP in Kenya.

The industry has grown tremendously since its liberalization in 1992 that led to the growth of the informal milk trade, which mainly consists of small-scale operators dealing in marketing of raw milk. The informal milk market controls an estimated 70 percent of the total milk marketed in Kenya. Raw milk markets offer higher prices to producers and lower prices to consumers but have several challenges relating to quality control and standards, and the associated health and safety concerns. The Dairy policy

acknowledges the role of small-scale milk vendors and contains specific measures to support them in addressing the identified challenges.

OBJECTIVES: This study examined the Kenya dairy sector through a synopsis of trends in milk productivity, and economic performance of the sector. The specific objectives of the study were to examine milk productivity trends; assess variable costs of production and gross margin at the farm level for different grazing systems; highlight the constraints in the dairy industry; and, outline policy implications in relation to the socio-economic issues in milk production and marketing.

DATA AND METHODS: The data for the study was obtained from three sources: (i) a panel rural household survey; (ii) a cross-section survey of dairy farmers; (iii) and, key informant interviews. The panel data was collected in 2000, 2004, 2007 and

2010 and consists of 1,245 households. The cross sectional survey was conducted between January and June, 2010. Information was collected from 106 small-scale dairy farmers across five milk sheds namely Trans Nzoia, Kinangop, Nyeri, Githunguri, and Kericho. Key informant interviews were conducted among managers of dairy processing plants and officials from the Ministry of Agriculture and the Kenya Dairy Board. Descriptive and gross margin analyses were used to address the objectives of the study.

MAIN FINDINGS: Results based on the panel data showed that the percentage of households keeping improved animals increased over the years, and was higher among male-headed households compared to female-headed households. As found in other studies, this may indicate that female-headed households have less access to improved dairy breeds, and perhaps dairy technologies in general. There were regional differences in number of cows kept. A higher proportion of households in the higher potential agricultural areas compared to those in the lower potential areas kept improved cows, and had larger herd sizes. Also, the high income households kept more cows than the low income households, particularly the improved breeds.

Milk productivity per cow per year increased between 2000 and 2007, with a decline in 2010 due the prolonged drought in most of 2008/2009 and 2009/2010 cropping years. Productivity showed variation across the different agro-regional zones. It was higher in the higher potential areas, which is consistent with the finding that a higher proportion of households in the higher potential agricultural areas compared to those in the lower potential areas kept improved cows and had larger herd sizes. However, productivity in any year was associated with high monthly/seasonal variations. Productivity increased up the income quintiles,

suggesting that dairy farming could be a preserve of the relatively better off households. The relatively low proportion of milk sold indicates that while dairy production was practiced by many households, most of them produced milk mainly for home consumption.

Purchase of concentrates formed the largest cost component among households practicing zero- and non-zero grazing systems. The cost of maintenance and repairs was the next largest expense in the zero-grazing system, while it was labour in the non-zero grazing system.

The performance of the smallholder dairy enterprises varied across the grazing systems. Both total value of milk produced by each lactating cow per month, and monthly variable costs per lactating cow were higher in the zero-grazing enterprises. As a result, the gross margin per cow per month in the zero-grazing system was lower, with a monthly return over variable costs of Ksh. 935. In the non-zero grazing system, the gross margin was Ksh. 1,567, which was 1.7 times higher than that in the zero-grazing system.

Overall, the ratio of gross margin to variable expenses was low for all households regardless of the grazing system, with every shilling invested in total variable costs returning just a few cents. However, the return to a shilling invested in concentrates was considerably higher in the non-zero grazing system.

The gross margin rate was low on average, but higher for the non-zero grazing system. Therefore, there was a financial advantage to the non-zero grazing dairying system, since a higher proportion of revenues in this system were available for covering fixed costs of land, labour, capital, and for a farmer's profit.

Across the milk sheds, Githunguri had a higher productivity and value of milk compared to other areas under the zero-grazing system. This may be attributed to membership in the successful Githunguri Dairy Farmers Cooperative Society and Processor, where dairy farmers are vertically integrated into the Cooperative society, and receive a number of benefits through the cooperative. It also had the highest gross margin per month per lactating cow, which was up to 12 times higher than in other areas. In the short run, dairy production under the zero-grazing system was economically viable, except in Nyeri, which had a negative gross margin.

For the non-zero grazing system, revenue from milk produced and gross margin per month per each lactating cow per month were highest in Kericho and lowest in Trans Nzoia. Overall, dairy production under the non-zero grazing system was economically viable in all milk sheds in the short run. Within the same milk shed, gross margin in Trans Nzoia was higher in the zero-grazing system, while in Kinangop and Nyeri, it was higher in the non-zero system.

Unlike in the case of panel data, more than 75% of the milk produced was sold across all selected milk sheds, indicating that dairy production is mainly done as a commercial enterprise, with the proportion being highest in Githunguri (88%). This is because the cross-sectional survey targeted smallholder dairy farmers in the major milk producing areas.

The overall better performance achieved in Githunguri compared to the other milk sheds indicates the importance of cooperatives in contributing to farmer incomes and rural development in Kenya.

POLICY IMPLICATIONS: Results from the study indicated that smallholder dairy farming was an economically viable enterprise in Kenya, in the short run. However, dairy farm performance measures showed that pasture-based

enterprises were somewhat more profitable than zero-grazing enterprises, when compared on a per cow or a per litre of milk basis.

Although there was a financial advantage to the non-zero grazing dairying system, the example of the Githunguri milk shed clearly showed that dairying under the zero-grazing system can be equally profitable, an important finding in the face of the shrinking size of smallholder farms. Dairying in this area was associated with higher productivity, better milk prices and higher gross margins per cow per month. The better performance for dairying in Githunguri is attributed to the importance of cooperatives in enabling farmers to process and market their milk collectively. This model of vertical coordination in dairy production confers a lot of benefits to farmers, enabling them to produce profitably and hence collective marketing needs to be encouraged.

High costs of concentrates were reported in both zero- and non-zero grazing systems. This indicates that farmers have to improve feed efficiency in order to increase their gross margin rate of return. This improvement could be achieved through investments in genetic improvements of cows kept and/or improving feed management, and other dairy management practices. These may require farmer training and better access to relevant information on dairy production through the extension system or the milk cooperatives. Therefore, greater commercialization of the dairy sub-sector and an increase in smallholder incomes will come from improved technologies that will make the existing resources more productive.

Other specific policy themes could have a major positive impact on smallholder dairying cost structure and profitability in future, particularly in the presence of seasonal intra-year variations in production. These include creation of a

strategic milk reserve to absorb excess milk during high production periods, and stabilize milk production shortfalls in the dry season; investment in processing of long life dairy products to absorb excess production and expand to non-traditional markets; investment in infrastructure (roads, collection points, cooling plants and electricity) to ease milk collection and processing; and, speedy implementation of

the national livestock feed policy to guide and promote on-farm feed preservation.

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