A Living from Livestock
Pro-Poor Livestock Policy Initiative

A Review of Milk Production in India with Particular Emphasis on Small-scale Producers

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EXECUTIVE SUMMARY

Introduction

Milk production is a livestock enterprise in which small-scale farmers can successfully engage in order to improve their livelihoods. Regular milk sales also allow them to move from subsistence to a market based income. The main purpose of this study was to gain insight into the household and farm economics of small-scale dairy farmers in India, the country with the highest number of small-scale dairy farmers by far, and to obtain estimates of their costs of milk production so as to gauge their vulnerability to international competition. In order to ascertain possible developments in the dairy sector and to broadly identify areas of interventions that favour small-scale dairy producers, the study examines impacts of changes in prices, farm management and other market factors that affect small-scale milk production systems, the whole farm and related household income. A case study approach is used, the aim being qualitative insight rather than quantitative extrapolation.

Methodology

The state of Haryana, one of the major milk producing states in India, was chosen for this study. The methodology applied for the economic analysis was developed by the International Farm Comparison Network (IFCN) and utilises the concept of typical farms. Farm types are determined on the basis of the knowledge of regional dairy experts. One farm 'type' of each region is chosen to represent the size that is close to the statistical average. The other 'typical' farms defined represent larger farms to assess the economies of scale in the region or to represent different dairy production systems. Management levels on the typical farms are average to slightly above average compared to other farms of their type.

In the case of Haryana, typical farms were defined by (a) location of the farm, (b) farm size and (c) the production systems that make important contributions to milk production in Haryana state. Data was collected using a standard questionnaire and a computer simulation model, TIPI-CAL (Technology Impact and Policy Impact Calculations), was used for biological and economic simulations of the typical farms and for the analysis of hypothetical scenarios involving changes in factors affecting milk production. The farm input data and the related output figures were discussed and validated with local experts and farmers.

Results

Milk production in India and Haryana State

In 2001 India became the world leader in milk production, closely followed by the USA, with a production volume of 84 million tons. More than half of the milk is produced by buffaloes. India has about three times as many 'dairy' animals as the USA, the vast majority (over 80 percent)being kept

in herds of 2 to 8 animals. Annual milk yield per dairy animal is about one tenth of that achieved in the USA and about one fifth of the yield of a New Zealand dairy cow.

In Haryana state, nearly five million tons of milk were produced in 2000, about 80 percent thereof derived from buffalo. Over the past five years, total milk production has increased by around 20 percent. Most of the growth has resulted from an increase in the number of crossbred cattle, whereas yield increases have been slight. Almost 90 percent of farms have less than one hectare of land and one to two dairy animals.

Analysis of 'typical farms' in Haryana

Based on IFCN methodology described four farm types have been identified as 'typical' and were subjected to the detailed analysis:

IN2: This farm represents a rural landless household with 2 buffaloes. The household consumes about 50 percent of its milk production while the rest is sold to the local milkman. This farm represents the vast majority of farms and is close to the average farm size in the area.

IN4: This farm is also located in a rural area but has 3.7 ha of land used for small grain crops. Four dairy animals (2 buffaloes and 2 cows) are kept. The milk is sold to a creamery in a town at 3 km distance.

IN22: This farm is located just in the periphery of a major city. It has 5.8 ha of land and keeps 22 dairy animals (18 cows and 4 buffaloes). Milk is sold to a local milk processing company under a multiyear contract.

IN37: This farm is located within a major urban area. It has no land and purchases all the feed for its 37 dairy animals (26 buffaloes and 11 cows). The milk is sold directly to the end consumer through its own creamery shop.

Although the large size of IN22 and IN37 is unusual and they may be considered as 'untypical' dairy farms in India, they represent the dairy segment with the highest growth rate in Haryana. Moreover their selection allows the analysis of economies of scale.

Dairy production systems

On all four farms the dairy animals are kept in tied stalls with no grazing. Milking is done by hand. Feed rations are based on agricultural by-products such as wheat straw, sugar cane tops, and weeds. All farms use some level of concentrate/compound feed. Buffalo are the main type of dairy animal, followed by crossbred cows, and finally local cattle. The family is in charge of the management of the farm and provides 100 percent of the farm labour on the two smaller farms whereas it provides at least 50 percent of the farm labour on the two larger ones. Production per dairy animal ranges from 800 to 3,676 kg/year (non fat corrected milk).

Household comparison

All farms have a more or less diverse income structure, income sources being the sale of milk, sale of cash crops, and off-farm employment. Annual household incomes range between 700 US$ (IN2) and 8,200 US$ (IN22).

Especially for farm IN2 the main cash income source is off-farm employment (70 percent). The net cash farm income just covers the farm cash costs and only contributes 7 percent to the household income. However, the non-cash benefits from the dairy obtained by the family in the form of milk and manure has a market value equivalent to 23 percent of household income.

Whole farm comparison

The returns from farming range from 200 US$ to 28,000 US$ per year. Net cash farm income closely follows the level of farm returns. The highest net cash farm income (8,100 US$/year) is achieved by farm IN22.

The net cash income of farm IN2 is only 43 US$ year. This is due mainly to the low share of milk sold and the interest rates paid for a loan from the milkman. The loan arrangement with the milkman also results in IN2 receiving the lowest milk price of the four farms studied. It must be kept in mind, however, that IN2 obtains other services and support from the milkman, which are not otherwise accessible to subsistence farmers.

Comparison of the dairy enterprise - Costs of milk production

Farms IN4 and IN22, both having land to grow crops and forage, are able to produce milk at 15 US$ per 100 kg. These farm types have the potential to compete with imports of dairy products and also to produce milk for export, provided international quality standards can be achieved and the dairy chain being internationally competitive.

The cost of milk production of farm IN37 is 50 percent higher (an additional 8 US$ per 100 kg milk) than that of farms IN4, IN22. This is due to higher feed costs as a result of having to purchase all feed. However, the high milk price obtained (an additional 8 US$ per 100 kg milk compared to IN22) compensates for the additional costs. IN37 fully covers its total production costs and should be economically viable in the long run.

The cost of milk production of farm IN2 amounts to 25 US$/100 kg and is thus significantly higher than the cost incurred by farms IN4 and IN22. This can be explained by economies of scale, low milk yields and poor breeding management (one calf per buffalo only every second year). Without major improvements farm type IN2 will, in the longer run, have difficulties competing with the larger farm types. At the moment, however, the main purpose of IN2 is to produce milk for home consumption by converting practically free feedstuffs into milk, livestock, and fuel and secondly to provide the female members of the family with an income-generating activity.

As in small dairy farms in most other countries, farm IN2 will keep its dairy animals as long as alternative employment opportunities (at 0,2 US$/hour in this case) are not available. Apart from these financial considerations, personal preferences of the people are likely to slow down the speed of structural changes in these subsistence milk production systems.

Dairy Chain in Haryana (preliminary estimates)

Consumer prices for fresh milk in the informal sector are slightly higher than in the formal sector. The prices paid to the farmer for milk with 6 percent fat are at the same level as the consumer price for milk containing 3 percent fat. The extracted cream value of 0,17 US$/kg covers the processing and retail cost in the chain.

The margin for milk processing and retailing in Haryana amounts to around 50 percent of what the dairy chain in Europe covers to deliver the milk to the consumer. The highest margins (0,21 US$/kg) in the chain are achieved by the milkman, while the lowest margins (0,06 US$/kg) are made by farms that directly sell milk to consumers with a fat content of 6 percent and do not extract the cream.

Predicted assessment of changes in production conditions and risks

Methods used by IFCN for the analysis of structural and policy changes are applied to small scale dairy farming in Haryana to quantify the impact of various changes in prices, farm management, policy and also to estimate the impact of major risks on household income. The focus being on testing of the methodology, simplified scenarios were used, based mainly on observations and estimates made by the authors. The results can be summarised as follows:

Price sensitivity

The larger and more specialised farms are more sensitive to price changes than the smaller farms, where most of the milk is consumed by the household and which generate most of the income from off-farm activities.

Production practices/policy

Farm IN2 has the potential to reduce the cost of milk production to the level of the larger farms (IN4, IN22) and could thereby achieve a remuneration from dairying that is higher than the wage

level in the area. This means that landless people in rural areas theoretically have the potential to run a profitable business, generate employment for family members, especially women, and could thus significantly improve their living conditions. For the improvement of the viability of farm type IN2, access to loans with reasonable interest rates as well as an increase of milk production (more animals in lactation and higher milk yield) are the most critical points.

Risk

The main risks identified by the farmers are not having an animal (buffalo) in lactation in any one year, the death of a lactating buffalo, having to pay for straw (which is the main feed source), and that the main income earner falls ill (and therefore cannot generate an off-farm income). Occurrence of any of the identified risks can lead to a reduction of household income by 50 percent. Occurrence of any of the four risks related directly to the dairy enterprise will lead to a reduction or cessation of this activity as the required investments financed with a loan at 50 percent interest are financially not viable.

Conclusions

The global livestock sector is changing rapidly. With a strong and growing demand and rapid institutional and macroeconomic policy changes, there is a significant danger that the poorer livestock producers will be crowded out and left behind. This could be prevented and, given the strong growth in demand for livestock products, engagement in livestock production could make an important contribution to global food security and poverty reduction.

This positive outcome will only occur, however, if an appropriate national and international policy framework is put in place. The question is: 'What is appropriate?' and 'How do we assess its appropriateness depending on specific factors?'

The IFCN methodology, applied by dairy economists in more than 20 countries, can be seen as a useful tool to quantify the economic situation of the small-scale, subsistence farms/households engaged in milk production. This is the case both for the current situation but also for specified policy and farm management scenarios. This potential for detailed impact assessment prior to implementation can assist in determining the most effective mix of support activities to be promoted by the Pro-Poor Livestock Policy Initiative.