

International competitiveness of small scale dairy farms in India/Pakistan

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Abstract

The paper answers the key questions about the economic situation of small scale dairy farms in south Asia (India and Pakistan) and their competitiveness with large farms domestically and internationally. The answers are based on using the method of the International Farm Comparison Network (IFCN) for selecting typical farm and cost analysis (HEMME, 2000).

The results of this study conclude that small scale dairy farming has a significant potential to compete at world milk market prices. The factors like milk quality, market access, non tariff trade barriers needs to be taken care of. The salient findings of the study are described below,

- Small scale dairy farms in India and Pakistan are not able to cover their full economic costs but are able to generate family farm income due to low cash costs.
- Small farms in these regions will remain existent as long as the farmers do not find suitable alternative employment opportunities for economic diversification to non farm jobs.
- There exists a significant element of economies of scale resulting in cost reduction by 30-50 percent between the small and large scale farms in India and Pakistan.
- International comparison of cost of milk production shows that small farms in general have equal potential to compete with the world milk producers as they have similar cost of production.
- Small farms have significant cost potential to decrease their costs upto 40 percent if they are able to improve their farm management, access to markets, services, infrastructure, jobs, etc..

Key words: small scale, dairy farming, cost of milk production, competitiveness, cost reduction, south Asia, India, Pakistan.

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Introduction

Increased commercialization of economic activities and liberalization of the factor product and capital markets have resulted into market competition for agricultural products. The global changes in trade and regulations have significantly influenced the agricultural sector. Only those countries which have comparative advantage in production are going to get benefit from the trade liberalization. Under the world trade organization (WTO) regime, small scale milk producers in developing countries are facing serious challenges. The industrialized and high income countries have relatively capital intensive production systems and have strong political pressure to protect the income of their dairy farmers.

The paper answers the four key questions regarding small scale dairy competitiveness:-

- What is the economic situation of small scale dairy farms?
- How competitive are these farms in comparison to large farms?
- How competitive are these farms internationally?
- What is the cost potential of these farms?

Methodology

The study is based on the approach of selecting typical farms and cost analysis using the International Farm Comparison Network (IFCN) method (HEMME, 2000). The typical farms are defined on the basis of statistical average of farm size and production system in a particular region. The typical farms are selected by (a) location in relation to the regional distribution of milk production and (b) size of the farm relative to farm size that makes important contribution to milk production in the country /regions.

The study is based on the farm data of year 2003 collected for IFCN Dairy report 2004 in India, Pakistan, New Zealand, Argentina, Poland, Germany and USA (HEMME et al, 2004). Two typical farms are selected from India and Pakistan and one each from rest of the five countries. Description about the typical farms selected from each country is described in the annex 1.

Results and Discussions

1 Economic situation of small scale dairy farms

1.1 Cost of milk production

The analysis shows that the small farms have very less productive systems with very low cash costs which are up to 6 US\$ per 100 kg energy corrected milk (ECM₁) in case of the Indian two cow farm (IN-2) and almost zero in case of the Pakistani one cow farm (PK-1) (figure 1.), which is only feeding crop residues/weeds collected free of cost from other farmers fields. Small farms are not feeding expensive feed items. For economic analysis, all the opportunity costs of family labour and owned capital are included in the cost calculation. Cost of milk production on these farms varies between 17 to 27 US\$ per 100 kg of ECM milk in Pakistan and India respectively.

1.2 Price competitiveness

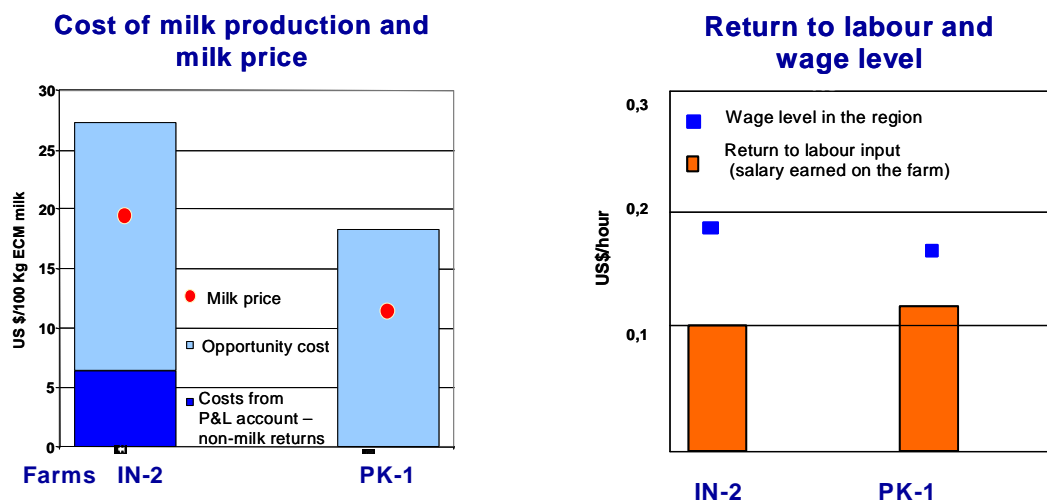
The milk prices on both of the small farms ranges between 11 to 20 US\$ per 100 kg ECM which is below the total costs (figure 1). Pakistani farm is receiving 35 percent lower milk prices as compared to world market price (US\$ 17 per 100 kg ECM) while the Indian farm is getting 15 percent higher price. With these existing milk prices, the returns of the dairy enterprise are lower than the total costs which means that both of the small farms are not able to cover their full economic costs.

1.3 Return to Labour

Although both small typical farms from India and Pakistan are not covering their full economic costs but are able to generate family farm income. The return to labour on small farms is almost 0.1 US\$ per hour which is half than the wage level paid in their region for hired labour (figure 1). Firstly, the reason why these small farms are existing is simply that the owners of these farms do not have alternative employment opportunities to engage their family labour that could generate more returns as compared to the dairy enterprise. In small farms the typical family labour consist of women and children who have rarely a chance of getting other paid work in rural areas. Secondly, the small farms are existing as the dairy is not only considered as family income source but also covers the risk of small farmers.

¹ **ECM milk** = ((total marketable milk production * 0.383*milk fat in percent) + (total marketable milk production * 0.242*milk protein in percent) + (total marketable milk production * 0.7832))/3.1138.

Figure 1: Economic situation of small dairy scale farms



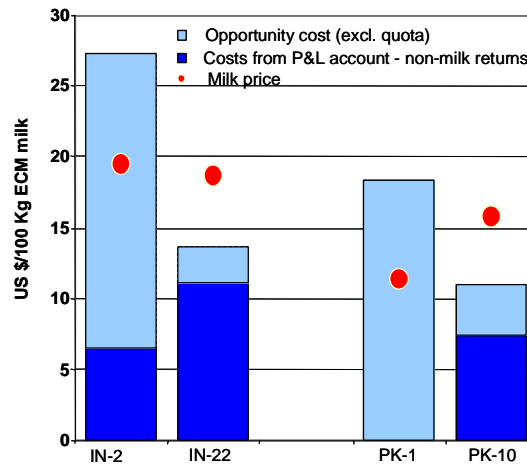
Legend: Farm types IN-2= two buffalo farm in India , PK-1=one buffalo farm in Pakistan

2 How competitive are small scale farms in comparison to large farms?

The comparison of large typical farms with small farms shows that, there is a significant cost difference between the costs of large and small farms in India and Pakistan. The large farms are producing milk at lower costs in the range of 11 to 13 US\$ per kg ECM (figure-2). The large Indian farm (IN-22) has almost 50 percent lower costs as compared to the small farm and the large Pakistani farm (PK-10) has 30 percent lower costs as compared to smaller one. The cash costs of the both large farms are significantly higher than the small farms but have lower opportunity costs. The lower opportunity costs are mainly driven by higher productivity of the large farms as both have high yielding animals that produce milk more than 2000 kg per lactation.

If we compare the farm income per kilogram of milk then it indicates that small farms have more income as compared to large farms. But the high volume of milk production on both large farms enables them to achieve higher farm income and return to labour. This shows that large farm types in India and Pakistan have a positive economies of scale effect. These large farm types are also able to maintain milk quality standards to sell milk at premium prices.

Figure 2: Comparison of small vs large farms



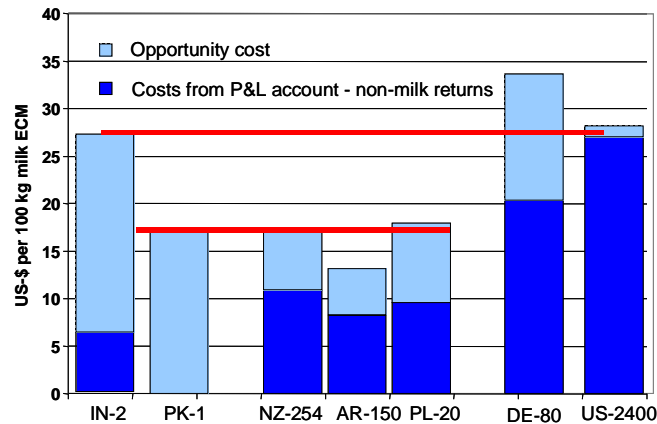
Legend: Farm types IN-2= 2 buffalo farm in India , IN-22= 17 crossbred cows and 5 buffaloes farm in India , PK-1=one buffalo farm in Pakistan, PK-10=8 buffaloes and 2 cow farm in Pakistan.

3 How competitive are small scale farms internationally?

The international comparison of the small typical farms in India and Pakistan with typical farms from New Zealand, Argentina, Poland, Germany and USA show that small typical farms in Pakistan with one animal (PK-1) shows similar cost level of \$17 US as that of New Zealand farm with 254 cows (NZ-254) and Poland farms with 20 cows (PL-20) while only the Argentina farm with 150 cows (AR-150) has 30percent lower costs (figure-3). But at the same time this small farm has 30-40 percent lower costs as compared to German farm with 80 cows (DE-80) and USA farm with 2400 cows (US-2400) (figure-3).

In general small farms are competitive because of relatively very low cash costs than large farms. These farms do not have well developed labour markets, hence even if they have higher full economic costs but they can survive till the labour markets are not fully developed.

Figure 3: International comparison of small scale farms

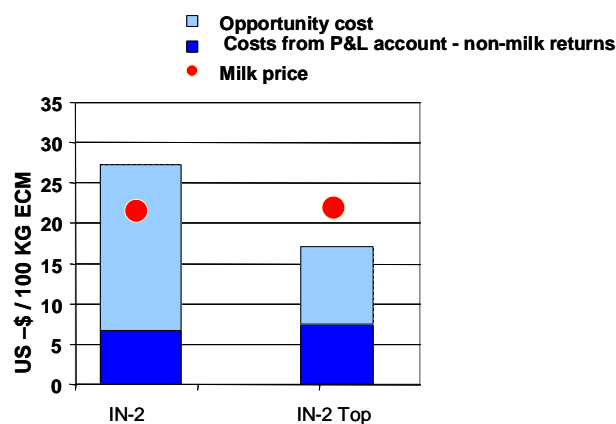


Legend: Farm types IN-2= 2 buffalo farm in India, PK-1=1 buffalo farm in Pakistan, NZ-254=254 cows farm in New Zealand , AR-150=150 cows farm in Argentina, PL-20=20 cows farm in Poland , DE-80=80 cows farm in Germany, US-2400=2400 cows farm in USA.

4 What is the cost potential of small scale farms?

The small dairy farms have significant potential to reduce their full economic costs. The study compared a well managed 2 cow farm with a typical farm in the state of Haryana in India (HEMME et al., 2003). The results indicated that a better managed small farm (IN-2 Top) has 40 percent lower costs (figure-4). The factors for the higher productivity are found to be high milk yields upto 1890 kg per lactation, better physiological parameters like reduced calving interval and lesser dry period. The farm has access to better livestock services and markets. The owner of the farm has a government job and works only part time on his farm . He has advantage of awareness about better farm management practices .

Figure 4: Cost potential of small farms



Legend: Farm types IN-2= 2 buffalo farm in India ,IN-2-Top=2 buffalo farm with good management in India.

Conclusions

The results of this study conclude that small scale dairy farming has a significant potential to compete at world milk market prices. The factors like milk quality, market access, non tariff trade barriers needs to be taken care of. The salient findings of the study are described below,

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- Small scale dairy farms in India and Pakistan are not able to cover their full economic costs but are able to generate family farm income due to low cash costs.
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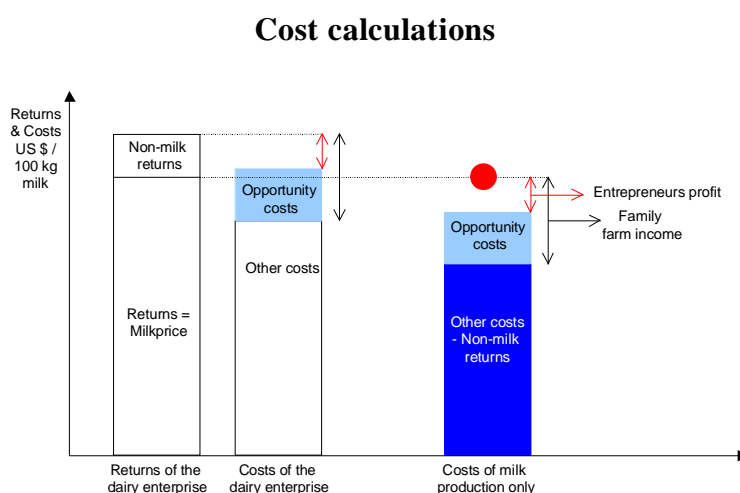
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Annexure 1

Description of IFCN Result Variables

Cost of milk production calculations



The cost calculations (Figure 6) are based on dairy enterprises that consist of milk production, raising of replacement heifers and forage production and / or feed purchased for dairy cows and replacements. The analysis outcome is the comparison of returns and total costs per kilogram of milk (energy corrected milk). Total cost consists of expenses from the profit and loss account (cash costs, depreciation, etc.), and opportunity costs for farm-owned factors of production (family labour, own land, own capital). The estimation of these opportunity costs are considered carefully because the potential income of farm owned factors of production in alternative uses is difficult to determine. In the short run, the use of own production factors on a family farm can provide flexibility in the case of low returns when the family can choose to forgo income. However, in the long run opportunity costs must be considered because the potential successors of the farmer will, in most cases, make a decision on the alternative use of own production factors, in particular their own labour input, before taking over the farm. To indicate the effects of opportunity costs, it is separated from the other costs in most of the figures.

For the costs estimation, the following assumptions are made:

Opportunity cost of labour

The wage rate per hour for a hired worker in that particular region is used as the opportunity cost of family labour.

Opportunity cost of land

The land rents currently paid by the farmers in the region are used as opportunity cost of owned land. In those countries with limited rental markets (like New Zealand), the land market value was capitalized at 4 per cent annual interest to obtain a theoretical rent price.

Opportunity cost of own capital

Own capital is defined as assets, without land and quota, plus circulating capital. For borrowed funds, a real interest rate of 6 per cent is used in all countries; for owner's capital, the real interest rate was assumed to be 3 per cent.

Quota costs

Rent values were used for rented or leased quota. Purchased quota values were taken as being the annual depreciation of values from the profit and loss accounts.

Depreciation

Machinery and buildings are depreciated using a straight-line schedule on purchase prices with a residual value of zero.

Adjustments of fat content

All cost components and forage requirements are established to produce ECM (energy corrected milk with 4.0 percent fat and 3.3 percent protein).

Farm Description

India

IN-2: This is a rural farm located in district Karnal in state of Haryana. The farm owns two buffaloes. The farm has no land for fodder production and depends on grazing animals in marginal or communal land. This farm type is also feeding crop residues collected from other farmers fields.

IN-2 Top: This is a rural farm in district Karnal in state of Haryana. The farm has two buffaloes. The owner of the farm works part time on the farm and has a government job. It is feeding good quality concentrate and has high milk yields. This farm is better managed in the region.

IN-22: This is family farm located in the rural area of district Karnal in state of Haryana. The farm has 17 crossbred cows and 5 buffaloes. The farm has 6 hectares of land and about 48 percent is used for fodder production. Rest of the land is used for other cash crops.

Pakistan

PK-1: This farm represents a rural land-less production system with 1 buffalo. The household itself consumes over 70 percent of its milk production and the rest is sold to the local milkman. This farm is located in district Layyah, south of Punjab province.

PK-10R: This is a rural farm with 6 ha land . The farm 10 milking animals consist of 8 buffaloes and 2 cows. Milk production is sold to the milk processing company. This farm type is increasingly becoming more popular. This farm is also located in the same region like PK-1.

Poland

PL-20: This farm is located in Lubuskie region. The farm has 20 cows . The farm owns 40 hectare of land. Only 73 percent of the land is used for dairy farming while rest is used for growing crops.

Argentina

AR-150 This farm type has 150 cows. This farm type is located in Cordoba region. The feeding system is based on grazing. The farm has 250 hectares of land . This land is 84 percent used for the dairy farming while rest is used for growing cash crops.

New Zealand

NZ-254: This farm is located in Waikato region. The farm has 254 Holstein Frisian cows. The farm owns 106 hectares of pastureland. All 100 percent of land is used for dairy raising.

Germany

DE-80:farm has 80 cows and is located in East north Germany in East Schleswig Holstein. The farm has 80 hectares of land. Only 80 percent of the land is used for dairy enterprise.

USA

US-2400: Farm has 2400 cows and also located in state of Texas. The farm owns 105 hectares of land which is 100 percent used for dairy.