

## ECONOMIC ANALYSIS OF MILK PRODUCTION IN DISTRICT OKARA

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### ABSTRACT

This study is based on a sample field survey of subsistent, semi-commercial and commercial livestock farmers in Okara district of the Punjab, Pakistan. The respondents were selected by stratified random sampling technique. The study revealed that there was variation in the lactation period across various farm categories. A wide fluctuation, both within and across various enterprises occurred in the summer and winter milk yield. Unquestionably, the per litre cost of milk production of commercial farmers was lowest and that of the subsistent operator was the highest. On the other hand, commercial farmers were able to sell their milk at prices higher than the other two categories. Consequently, they registered higher sale receipts per buffalo. The benefit cost ratio varied inversely with the operational size of milk production unit. The findings of this study, when viewed in the context of other studies, imply that there had been little or no shift in the functional and size distribution of cost structure over time. It is necessary to take steps to improve milk production to bridge the existing gap in the demand and supply of milk.

### INTRODUCTION

The importance of livestock sector in agricultural economy of Pakistan can be assessed from the fact that it contributed over 8% towards GDP and around 32.03% to the total agricultural production during 1995-96 (Anonymous, 1997). Milk and milk products constitute an important component of the food basket and are second only to cereals in the level of per capita consumption. Traditionally, milk production has been subsistence, though about five million farm families are involved in production, collection, and distribution of milk. About 33 million people directly or indirectly derive their livelihood from dairy industry. The current value of milk and its by-products is estimated to Rs. 50.86 billion per annum, which is greater than the value of any single crop grown in Pakistan (Anonymous, 1996).

In Pakistan, milk is mainly produced by buffaloes and cattle. During the period from 1970-71 to 1994-95, milk availability increased from 7.8 to 19 million tones, with an average growth rate of 2.47%. At present, per capita availability of milk is 139 litre per annum as against estimated requirement of 160 litre. This gap in supply and demand of milk was being bridged by the import of powdered milk and its products amounting to Rs. 730 million during 1993-94 (Anonymous, 1994). Demand for milk over time is likely to increase and as Pakistan cannot afford the luxury of importing milk, it is, therefore, necessary to increase milk production.

The efficiency analysis of milk producers has been an area of researcher's interest. Rao *et al.* (1991) found that cost of production per milch buffalo was low (Rs. 9612.00) on large farms and high (Rs. 10026.00) on small farms. Average annual milk production per buffalo was low on small farms (2212 litres) and high on large farms (2250 litres), this higher milk production was attributed to the commercialization of dairy farming. Net income earned was Rs. 1979.00 and Rs. 2634.00 on small and large farms, respectively.

Kumar and Gupta (1988) found that highest per day milk yield of crossbred cows was obtained by large farms followed by upper medium farms. The average daily milk yield of the buffalo and local cow was computed at 4.98 and 3.74 litres, respectively.

The objectives of the present study were to analyze the cost and return from milk production and to work out financial gains at different levels of operation.

### MATERIALS AND METHODS

The study is based on data collected from livestock holders in district Okara during 1992-93. The respondents were selected using stratified random sampling technique. In the study one village each from four union councils was selected at random. These villages were; Fatehpur, Burj Jeway Khan, Youngpur and Burj Alya. The farms were stratified on the basis of herd size as I. Subsistent farms; 1-3 adult milch animals, II. Semi-commercial farms; 4-10 adult milch

animal, and III. Commercial farms; above 10 adult milch animals.

In the subsistent and semi-commercial strata, ten farmers from each village were drawn at random (thus forty farmers for each stratum). However, all the 15 commercial farms were included in the study. Thus, the total sample size was 95 respondents. Data were collected by personal interview method and from the available records of commercial farms. Most of the cost calculation formulae, definitions, and operational concepts used in the analysis are those described by Ahmad *et al.* (1996).

## RESULTS AND DISCUSSION

### Milk Yield

The average milk yield was 3266.66, 2667.20 and 3140.87 litres per lactation for subsistent, semi-commercial and commercial farms, respectively (Table 1). This finding is not in conformity with the findings of Rao *et al.* (1991) who found a positive relationship between milk production and farm size. Average winter (high calving period) milk production was higher than summer (low calving period). Buffalo yielded 60% milk in the high calving and 40% in the low calving period. Nutritional deficiency may have depressed milk production in summer because many animals do not get sufficient feed in mid lactation, and this especially affects animals calving during August - October. Moreover, lactating animals which experience a substantial feed deficiency for a long period do not generally re-gain their potential yield, the lactation period gets shortened and the efficiency of milk production is decreased. Ali (1990) found considerable variations in milk prices during winter and summer seasons. The higher price during summer season is attributable to reduction in milk supply due to a fall in production and increase in milk demand.

The difference in milk yield during the high and the low calving period was higher in commercial than semi commercial and subsistent farms. The order of milk yield per buffalo in high and low calvers, on over all basis, descended from commercial to subsistent and semi - commercial producer. This may possibly be due to technological advantage enjoyed by the commercial farmers where as the subsistent farmers paid more attention to feeding and management, as milk sale was a major source of their family income. Partial adoption of the technology and poor management practices, due to increased herd size, may have reduced yields in semi commercial units. Another reason could be the inappropriate definition of this category and, more importantly, the fact that most of such units operated on marginally productive lands and practiced

uncontrolled grazing.

### Cost of Milk Production

The overall cost per lactating buffalo was Rs. 11060.63, comprising of Rs. 1859.93 as fixed cost and Rs. 9200.71 as variable cost. The fixed and variable costs were higher on the commercial than on semi commercial farms. However, total cost was highest on subsistent farms and lowest on semi commercial farms.

A study of the total cost and cost per litre of milk production revealed the true nature of enterprise profitability. Total cost of milk production was Rs. 1050760 on an overall basis. By type of livestock owner, it was Rs. 490665, 402953 and 157136 for subsistent, semi commercial and commercial farms, respectively. This works out to a per litre milk production cost of Rs. 3.90, 3.71 and Rs.3.20, for these farm categories, respectively. The per litre milk production costs varied inversely with the operational size of the farm; being highest for subsistent farms and lowest for commercial farms. This may be due to the small operational size of the livestock unit resulting in diseconomies of scale and higher expenditure incurred on concentrate feeding as is evident from a comparison of the variable cost component. Wahla (1982) observed similar patterns of per litre cost for large, small and tenant (subsistent) milk producers. This implies that there had been little or no shift in the milk production potential and technology during the last fifteen years, although unit costs have increased substantially.

### Revenue From Milk

On an average, a milking buffalo produced milk worth Rs. 13348.69, 11378.10 and 16333.30 on subsistent, semi commercial and commercial farms, respectively. Moreover, commercial farmers received 15 % higher milk price. The price differential may be attributed to assured supply, transportation resources, bulk production, and greater bargaining power. A plausible policy implication of this finding is that minimum milk price, commensurate with the price received by the commercial producers, should be fixed in order to provide incentive to milk producers to adopt milk production on commercial scale. However, detailed studies would be required to determine a viable price policy program keeping in view the impact of seasonal and regional factors.

### Benefit-cost Ratio

On overall basis, the benefit cost ratio (BCR) of milk production was 1.29:1. The BCRs for subsistent, semi commercial and commercial producers were 1.11:1, 1.16:1 and 1.60:1, respectively. This shows that the BCR varied directly with the operational size

Table 1: Economic analysis of different levels of milk production

| Criteria   | Types of farm |                 |            |          |
|--|---------------|-----------------|------------|----------|
|  | Subsistent    | Semi-commercial | Commercial | Over all |
| Lactation period (days)                                    | 370           | 351             | 355        | 356.66   |
| Milk production per lactation (Litre)                      |               |                 |            |          |
| In high calvers  | 2000          | 1667            | 2105.47    | 1668.26  |
| In low calvers   | 1266.67       | 1000.20         | 1035.40    | 1096.95  |
| Average  | 3266.67       | 2667.20         | 3140.87    | 2965.50  |
| Cost per buffalo per annum (Rupees)                        |               |                 |            |          |
| Fixed costs  | 1873.03       | 1812.23         | 1952.20    | 1859.93  |
| Variable costs   | 10393         | 8261.75         | 8523.53    | 9200.71  |
| Total costs  | 12266.63      | 10073.98        | 10475.73   | 11060.63 |
| Total costs and cost per litre of milk production (Rupees) |               |                 |            |          |
| Fixed costs  | 74920         | 72489           | 29283      | 176693   |
| Variable cost  | 415744        | 330470          | 127853     | 874067   |
| Total costs  | 490665        | 402953          | 157136     | 1050760  |
| Milk production (Litres)                                   |               |                 |            |          |
| Total  | 125635        | 107088          | 49000      | 281723   |
| Average  | 3266.66       | 2677.20         | 3140.87    | 2965.50  |
| Cost per litre   | 3.90          | 3.71            | 3.20       | 3.70     |
| Revenue from milk production (Rupees)                      |               |                 |            |          |
| Price per litre  | 4.25          | 4.25            | 5.00       | 4.36     |
| Average total income from milk                             | 13348.69      | 11378.10        | 16333.30   | 13686.69 |
| Average total cost   | 11976.63      | 9783.98         | 10185.73   | 10648.78 |
| Benefit cost ratio(BCR)                                    | 1.11:1        | 1.16:1          | 1.60:1     | 1.29:1   |

of the livestock enterprise, being highest for the commercial farms and lowest for the subsistent farms. The economic theory predicts that the economies of scale (in the use of concentrate and fodder), better technology and improved management practices on large farms exhibited better BCR. Clearly, the commercial farmers were the leading beneficiary of milk production per animal followed by semi commercial and subsistent farms.

It is evident that in view of explosive population growth, the already existing imbalance in demand and supply of livestock products, especially milk, is likely to worsen in the coming years. It is, therefore, necessary to take suitable steps for substantial improvement in milk supply as well as other livestock products. For this purpose, following suggestions are put forward in the light of the results of this study.

- \* Genetic improvement in the stock of milk animals, especially buffaloes, may help improve yield potential significantly. To this end, selective breeding should be popularized at the common farm level.
- \* For providing balanced nutrition to the milch animals, non-traditional sources of feed and green fodder need to be explored. This may help reduce seasonal fluctuations in milk supply.
- \* The subsistent livestock farmers be given credit facilities for steady shift towards commercial farming.
- \* For successful commercial rearing of herds of milch animals, a very effective health coverage should be provided right at the door steps of the small livestock holders.

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