COST OF MILK PRODUCTION IN DISTRICT TOBA TEK SINGH, PUNJAB, PAKISTAN

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This study was carried out in district Toba Tek Singh (Punjab) to determine the cost of milk being produced at farm level. Primary data were collected by selecting the respondents and interviewing them through a comprehensive questionnaire. Village data were further categorized on the basis of number of milch animals kept such as: i) rural subsistence (1-3 adult milch animals), ii) semi-commercial herd (4-10 adult milch animals), and iii) commercial herd (> 10 adult milch animals). The cost per litre of milk for rural subsistence, semi-commercial, commercial farmers and overall was Rs. 5.09, 5.06, 4.70 and 5.04 respectively. Prevalent market price of milk at farm gate was taken for the calculation of gross returns from the milk. On an average, a milch animal produced milk/lactation worth Rs. 17200.40, 16843.05 and 18681.19 in the rural subsistence, semi-commercial and commercial milk producing category respectively.

Key words: milk production cost, Toba Tek Singh

INTRODUCTION

Milk production business provides employment especially to the landless and small farmers in rural and peri-urban areas of Pakistan. According to an estimate about five million farm families are involved in production, collection and distribution of milk and its products. The activities of this subsector account for 10 to 25% of the incomes of small farmers and landless livestock producers depending on the accessibility of the market. About 33 million people are directly or indirectly involved in dairy farming and other related industries. Estimated value of milk and its products is about Rs. 50.86 billion per annum (Anonymous, 1997-98).

It is estimated that at present, 22.04 million tonnes milk is produced in the country. Per capita availability of milk is 124.5 litres, while the demand is 160 litres per capita per annum. The gap in supply and demand is being bridged by the import of milk and other products (10377 tonnes) amounting to Rs. 629.095 million (Anonymous, 1993-94). Pakistan cannot afford the luxury of importing milk and milk products. Demand for milk over the time is very likely to increase due to growth in population, increased incomes and urbanization. It is, therefore, necessary to meet the increasing demand of milk and its products from domestic sources. The aim of this study was to determine the cost of milk being produced at farmers level and possibly to explore the remedies of the problems confronting the rural livestock owners.

MATERIALS AND METHODS

Data Collection: A total of 122 respondents belonging to the randomly selected villages of two union councils of each of the three Tehsils of Toba Tek Singh were interviewed using a comprehensive and pretested questionnaire for the collection of data. The village data were further categorized on the basis of the number of milch animals kept.
was charged (\(\text{Rs.}\) 5.5%).

b) Value of Sheds: Both the Pacca. Kacha and mixed type
sheds were seen in the area of study. For the purpose
of cost estimation. depreciation at the rate of 2.5% for
Pacca. 5% for Kacha and 4% for Kacha cum Pacca were
charged on the current value of the shed. In 1987. Chaudhry
and Ahmad used the following formula for apportioning
the cost to various animals on the basis of adult animal
units:

\[
\text{MP} = \text{SC} \times \text{MAffA}
\]

where,

\[
\text{MP} = \text{Cost of shed for milch animals} \\
\text{SC} = \text{Total cost of shed in rupees} \\
\text{MA} = \text{Milch animal units} \\
\text{TA} = \text{Total animal units}
\]

iii. Feeding Cost: In the study area green fodder was
the major input for livestock feeding. Total cost of green
fodder was calculated according to the method given by
Chaudhry and Ahmad (1987). The value of cottonseed cake,
wheat bran. ghee. oil and Gur was considered as the
concentrate cost.

RESULTS AND DISCUSSION

1. Animal Distribution and Milk Production: Milk pro-
duction is a function of wet animals in the herd. Data
showed that 70 (67.31%) cattle and buffaloes of rural
substance farmers were in milk. while the rest were dry
either open or pregnant, whereas for semi-commercial and
commercial farmers. the number of wet animals was 116
(66.29%) and 124 (69.66%) respectively (Table 1). The area
under study had more than 90% buffaloes; a few cows
were there may be due to the liking of people or due
to the same rate of milk of both the species. Owing to
the same rate of buffalo and cow milk and selling total
produce at the same rate, the price was calculated on
lactation basis without keeping the species difference in
view.

The milk production in litres was 2218 (64.48%).1983 (61.81%)
and 2301 (67.76%) in winter which was higher than that
in summer. being 1222 (35.52%). 1225(38.19%) and 1095
(32.24%) of the total production for rural subsistence. semi-
commercial and commercial groups respectively. These results
are in line with the findings of Vasan et al. (1992) who
reported a total lactation yield of 2986 litres in 425 milking
days. In this study. the production in first two categories
was higher not because of high producing animals. rather
it may be attributed to unnecessarily extended lactation.

Duration of lactation of animals in rural subsistence. semi-
commercial and commercial groups was 380. 375 and 361
days with the total lactation production of 3440. 3208 and
3396 litres respectively. The milk production in winter and
summer was 2169.60 (64.76%) and 1180.67 (35.24%) litres
with an overall lactation production of 3350 litres in all
categories.

2. Cost of Milk Production

i. Fixed Costs: The total fixed cost on overall basis was
Rs. 2844.04 including the interest on the value of animals.
Rs. 953.93; animal depreciation. Rs. 1211.76 and shed. Rs.
305.76 plus the miscellaneous costs of Rs. 164.51 (Table
2). In the rural subsistence. the amount of interest on
the value of animals was Rs. 963 and for semi-commercial
and commercial categories these values were Rs. 90.19
and 1072.75 respectively. During one lactation period the
depreciation cost of shed per milch animal was Rs. 305.46.
298.40. and 335.00 for rural subsistence. semi-commercial
and commercial farmers respectively. Depreciation values
for sheds and miscellaneous costs were not much different
for the three groups. probably due to similar housing patterns
adopted by the village farmers.

ii. Variable Costs: Major components of variable costs
incurred by milk producers were cost of green fodder. dry
fodder. concentrates and labour cost as shown in Table
3. The overall variable cost was Rs. 14050.KK. which included
the feeding cost of green fodder. wheat straw and con-
centrates amounting to Rs. 7484.32 (53.27%) and Rs. 6566.56
(46.73%) as cost of labour respectively. The total variable
cost per animal was Rs. 14639.95. 1348K.55 and 1216K.75
for rural subsistence. sem1-commercial and commercial milk
producers respectively. The higher percentage of
labour employed by rural subsistence farmer's category was
due to the limited feeding resources and more family labour
available to them. These findings are in line with those
of Tailor et al. (1992) who reported that cost of roughages and
production ration was 27.60 and 26.21% respectively.

The miscellaneous expenditures reported by these authors
were lower (5.39%) than those of the present study (12%
(Table 2) which may be due to the intensive pressure
of population. scarcity of AI and vaccination facilities and
costly veterinary cover. However. the total cost of feeding
in this study is lower than that reported by Rao et al.
(1991) who observed that feeds and fodder costs together
accounted for about 71% of the total cost.

3. Per Litre Cost of Milk Production

The cost per litre of milk is a function of milk yield per
day. duration and character of lactation period and type
of animals. For actual cost of milk production. the value
of farm yard manure 'was deducted from the total cost.
The cost per litre of milk was computed by excluding the
Cost of milk production

The average cost per lactating animal in the rural subsistence producers group was Rs. 17520.70. Of this, Rs. 2880.75 (16.44%) was fixed cost and the remaining Rs. 14639.95 (83.56%) was the variable cost. In semi-commercial group the average cost was Rs. 16241.04. Of which fixed cost was Rs. 2752.49 (16.95%) and the variable Rs. 13488.55 (83.05%). Such cost in commercial farms was Rs. 15957.23 with fixed cost of Rs. 2988.48 (18.71%) and the variable Rs. 12968.75 (81.27%). The overall average cost per lactating animal was Rs. 16894.92. Of this, Rs. 2844.04 (16.83%) was the fixed cost and Rs. 14050.88 (83.17%) being the variable (Table 4). The cost per litre of milk for rural subsistence, semi-commercial, commercial producers and overall was Rs. 5.09, 5.06, 4.70 and 5.04 respectively. These results are supported by Vasani et al. (1992) who computed the bulk line cost of milk production as Rs. 5.05 per litre.

The difference in average cost per lactating animal is due to the different amount of labour employed and differential availability of green and dry fodder resources. The trend found in this study substantiates the findings of Din (1984) who determined that per litre cost of milk production was Rs. 4.69 and 3.14 for cows and buffaloes respectively but this study was done ten years ago when the costs were much lower. Similarly, Ayub et al. (1990) reported the cost of milk for rural subsistence in the area of Muzaffargarh. The cost of fodder production for commercial milk producers was less which in turn was reflected in lower price of their produce and ultimately led to greater margin of profit for them compared to other groups. Cheap and efficient labour utilization in this case is another added advantage where more labour hours are required for cutting of fodder, hauling, chopping and feeding to the animals. The commercial producers are also wise to keep preferably high producing animals which fetch them more profit.

4. Economics of Milk Production

Prevalent market price of milk at farm gate was taken for the calculation of gross returns from milk as shown in Table 5. On average the value of milk produced per animal was estimated as Rs. 17200.40, 16843.05 and 18681.19 by the rural, semi-commercial and commercial milk producers respectively. On the basis of the data obtained from 122 farms, the average income from milk per animal was Rs. 17214.23 and the input-output ratio was 1:1.04 with an annual profit of Rs. 642.23. The input-output ratio for rural subsistence, semi-commercial and commercial groups was 1:1, 1:1.07 and 1:1.06 respectively. These findings agree with the results of Vasani et al. (1992) who reported the mean cost benefit ratio as 1:1.08, ranging from 1:1.05 for landless to 1:1.10 for large farmers.

The commercial farmers were the major beneficiaries of milk per animal which was due to large herd size, high yielding animals, fodder resources, concentrate feeding and their awareness about the modern production practices. They also received 10% higher milk price on the basis of ensured supply, transportation facilities and bulk supply. The findings of this study conform to the findings of Goswami and Rao (1992) who reported that input-output ratio was the highest on large farms followed by medium farms. However, Grover et al. (1992) reported a net loss of Rs. 1016 per buffalo per annum which was partly because the family labour employed was imputed in their study at much higher rates than their opportunity cost.

Table 1 Milch herd distribution and milk production

<table>
<thead>
<tr>
<th>Category of farmer</th>
<th>Milch herd</th>
<th>Milk production/animal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wet Preg.</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>animals dry dry</td>
<td>(l)</td>
</tr>
<tr>
<td>Rural subsistence</td>
<td>70 20</td>
<td>14</td>
</tr>
<tr>
<td>Semi-commercial</td>
<td>116 41</td>
<td>18</td>
</tr>
<tr>
<td>Commercial</td>
<td>124 31</td>
<td>21</td>
</tr>
<tr>
<td>Overall</td>
<td>310 92</td>
<td>55</td>
</tr>
</tbody>
</table>

Figures given in parentheses indicate percentages.
### Table 2: Fixed cost incurred/animal/year

<table>
<thead>
<tr>
<th>Category of farmer</th>
<th>No. of farms</th>
<th>Amount of interest (Rs.)</th>
<th>Animal depreciation (Rs.)</th>
<th>Depreciation on shed (Rs.)</th>
<th>Misc. cost (Rs.)</th>
<th>Total fixed cost (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural subsistence</td>
<td>65</td>
<td>963.00</td>
<td>1236.52</td>
<td>305.46</td>
<td></td>
<td>2XX/1.75</td>
</tr>
<tr>
<td>Semi-commercial</td>
<td>45</td>
<td>(33.43)</td>
<td>(42.93)</td>
<td>(10.60)</td>
<td></td>
<td>(13.05)</td>
</tr>
<tr>
<td>Commercial</td>
<td>12</td>
<td>1072.75</td>
<td>1211.50</td>
<td>335.00</td>
<td></td>
<td>(275Z,.8)</td>
</tr>
<tr>
<td>Overall</td>
<td>122</td>
<td>953.93</td>
<td>1219.76</td>
<td>305.76</td>
<td></td>
<td>364.59</td>
</tr>
</tbody>
</table>

### Table 3: Variable cost incurred/animal/year

<table>
<thead>
<tr>
<th>Category of farmer</th>
<th>Green fodder (Rs.)</th>
<th>Wheat straw (Rs.)</th>
<th>Concentrate (Rs.)</th>
<th>Total feeding cost (Rs.)</th>
<th>Labour cost (Rs.)</th>
<th>Av. variable cost (Rs.)</th>
<th>Milk prod (l)</th>
<th>Cost per lit. milk (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural subsistence</td>
<td>4413.05</td>
<td>888.39</td>
<td>2217.71</td>
<td>7619.15</td>
<td>7020.80</td>
<td>14639.95</td>
<td>3~ I0X.~26</td>
<td></td>
</tr>
<tr>
<td>Semi-commercial</td>
<td>4303.35</td>
<td>850.50</td>
<td>2243.09</td>
<td>7396.94</td>
<td>6091.61</td>
<td>13488.55</td>
<td>32UX,20</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>4213.83</td>
<td>809.83</td>
<td>2057.92</td>
<td>7081.58</td>
<td>5887.17</td>
<td>12968.75</td>
<td>33%.62</td>
<td>3.82</td>
</tr>
<tr>
<td>Overall</td>
<td>4353.00</td>
<td>866.69</td>
<td>2264.43</td>
<td>7484.32</td>
<td>6566.56</td>
<td>14050.88</td>
<td>~n50.27</td>
<td>~ay</td>
</tr>
</tbody>
</table>

### Table 4: Average cost of milk production

<table>
<thead>
<tr>
<th>Category of farmer</th>
<th>No. of farms</th>
<th>Fixed cost (Rs.)</th>
<th>Vegetable cost (Rs.)</th>
<th>Total cost (Rs.)</th>
<th>Milk prod (l)</th>
<th>Cost/Lit (Re. 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural subsistence</td>
<td>65</td>
<td>281D.75</td>
<td>(16.44)</td>
<td>14639.95</td>
<td>17520.7</td>
<td>3440.08</td>
</tr>
<tr>
<td>Semi-commercial</td>
<td>45</td>
<td>2752.49</td>
<td>(16.95)</td>
<td>13488.55</td>
<td>16241.04</td>
<td>3208.20</td>
</tr>
<tr>
<td>Commercial</td>
<td>12</td>
<td>2988.48</td>
<td>(18.73)</td>
<td>12968.75</td>
<td>15957.23</td>
<td>3396.58</td>
</tr>
<tr>
<td>Overall</td>
<td>122</td>
<td>2844.04</td>
<td>(16.83)</td>
<td>14050.88</td>
<td>16894.92</td>
<td>3350.27</td>
</tr>
</tbody>
</table>

Figures given in parentheses indicate percentages.
Table 5. Economics of milk production

<table>
<thead>
<tr>
<th>Category of farmers</th>
<th>No. of farmers</th>
<th>Milk prod(l)</th>
<th>Price/litre (Rs.)</th>
<th>Income from milk (Rs.) excl., FYM (Rs.)</th>
<th>Total cost (Rs.)</th>
<th>Cost-benefit ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural subsistence</td>
<td>65</td>
<td>3440.08</td>
<td>5.00</td>
<td>17200.40</td>
<td>17020.70</td>
<td>1:1</td>
</tr>
<tr>
<td>Semi-commercial</td>
<td>45</td>
<td>3388.58</td>
<td>5.25</td>
<td>16843.05</td>
<td>15941.04</td>
<td>1:1.06</td>
</tr>
<tr>
<td>Commercial</td>
<td>12</td>
<td>3396.58</td>
<td>5.50</td>
<td>18681.19</td>
<td>15607.96</td>
<td>1:1.19</td>
</tr>
<tr>
<td>Overall</td>
<td>122</td>
<td>3350.27</td>
<td>5.14</td>
<td>17214.23</td>
<td>16590.00</td>
<td>1:1.14</td>
</tr>
</tbody>
</table>

REFERENCES
