Pak. J. Agri. Sci. VOl. 37(3-4), *2000*

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

Muhammad Anwar & Muhammad Younas
Dept. of Livestock Management, University of Agriculture. Faisalabad

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 herds> 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 respectivcty. 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 producers category respectively.

Key words: milk production cost, Toba Tek Singh

INTRODUcnON

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 abridged 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 yillage data were further categorized on the basis of the number of milch animals kept:

i) Rural subsistence: 1-3 adult milch animals
ii) Semi-commercial herd: 4-10 adult milch animals
iii) Commercial herd: > 10 adult milch animals

The number of farmers interviewed in these categories in the same order was 13,9 and 12 respectively. Personal interviews were taken at their door steps during the months of Jan. and Feb. Data were analyzed and means and percentages were determined for various economic traits.

Cost Estimation

i, Labour Input (family/bired labour): Labour used in each livestock operation was considered separately and the animals were taken as adult animal units (AU). Labour used for the livestock sector is a function of variables like fodder cutting, chaffing. feeding. watering. milking etc. The labour units of the family workers and their cost were estimated by using the method of Chaudhry (I lJ70) and the cost of labour used for livestock sector was worked out according to Chaudhry and Ahmad (19X7). It may be an incidence that during survey no hired labour exclusively for livestock was reported. Because most of the people are hired for agricultural operations and t1tey ma~ spend some time for taking care of livestock. Chores concerning the livestock operations are usually accomplished by the family labour as a part of their daily routine. Keeping these bases in view. the total cost of family labour and permanently hired labour per annum was estimated.

H. Capital Input, Interest and Depreciation: a) Milch Animals: Capital input interest and depreciation charges for milch animals were determined as reported by Chaudhry and Ahmad (1987). In most of the cases. the farmers kept their animals continuously even when they got dry. On calving again, the animal became as good a milch animal as was before drying off. Interest was charged at 7% (i.e. half of the normal interest rate) 'on the average of the maximum and minimum price ofthe animal and depreciation

was charged (ijJ, 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:

MP = SC x MAffA

where.

MP = Cost of shed for milch animals
SC = Total cost of shed in rupees
MA = Milch animal units
TA = 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 production is a function of wet animals in the herd. Data showed that 70 (6731%) cattle and buffaloes of rural subsistence 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 farmers, respectively. These results are in line with the findings of Vasani 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

l, 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. 121lJ.76 and shed. Rs. 305.76 plus the miscellaneous costs of Rs. 164.5tJ (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. 90tJ.n 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. scuu-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 concentrates amounting to Rs. 7484.32 (53.27'10) and Rs. 6566.56 (46.73%) as cost of labour respectively. The total variable cost per animal was Rs. 14639.95. 1348K.55 and 12tJ6K.75 for rural subsistence. sell.li-commercialand commercial milk producers respectively. Feeding cost was the most important component of variable costs. The difference in the feeding cost. was due to the fodder and land resources availability with three categories of farmers. Average variable cost per litre of milk was Rs. 4.26, 4.20 and 3,83 for rural subsistence. semi-commercial and commercial milk producers respectively with an overall cost as Rs. 4.19 per litre of milk.

Labour part of the total variable cost per lactating animal was Rs. 7020.80 (47.96%). 6091.60 (45.16%,) and 5887.17 (45.33%) for rural .subsistence. semi-commercial and commercial farmers 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 Al and vaccination facilities and costly veterinary cover. However. the total cost of feeding in this study is lower than that reported b~ 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 thc total cost. The cost per litre of milk was computed by excluding the

quantity fed to the calf. 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 theremaining 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 thevariablebeingRs. . 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 farmers 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 costJ litre as Rs. 4.01 and Rs. 4.27 for cow and buffalo milk respectively 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 toa 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 subsistence, semi-commercial and commercial milk producers respectively. On the basis of the data obtained from 122 farms., the average income from milk/animal was Rs. 17214.23 and the input-output ratio was I:1.04 with an annual profit of Rs. 642.23. The input-output ratio for rural subsistence, semi-commercial andcommercial groups was 1:1, 1:1.06 and 1:1.06 and 1:1.19 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 I:1.1O 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 modem 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-outpul 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

	Milch herd				Milk production/animal		
Category of farmer	Wet animals	Preg. dry	Open dry	Winter production (I)	Summer production (l)	Lactation period (days)	Av. production/ lactation (I)
Rural subsistence	70 (67,31)	20 (19.23)	14 (13.46)	2218 (64.48)	1222 (35.52)	m	3+1()
Semi-eommercial	116 (66.29)	41 (23.43)	18 (10.28)	1983 61,81)	1225 (38,19)	375	320X
Commercial	124 (69.66)	31 (17,42)	21 (12.92)	2301 (67.76)	1095 (32.24)	361	33%
Overall	310 (67.83)	92 (20.13)	55 (12.04)	2169.60 (64.76)	llro.67 (35.24)	376	3350

Figures given in parentheses indicate percentages.

Table 2. Fixed cost incurred/animal/year

Category of, fanner	No. of farms	Amount of interest (Rs.)	Animal depreciation (Rs.)	Depreciation on shed (Rs.)	Misc. cost (Rs.)	Total fixed cost (Rs.)
Rural subsistence	65	963.00 (33.43)	1236.52 (42.93)	305.46 (10.60)	375.77 (13.05)	2XX/I.75
Semi-commercial	45	<x>9.13 (33.03)	1197.76 (43.52)	298.40 (10.84)	347.20 (12.61)	275Z..b
Commercial	12	1072.75 (35.90)	1211.50 (40.54)	335.00 (11.21)	369.19 (12.35)	2l)~.~X
Overall	122	953.93 (33.54)	1219.76 (42.89)	305.76 (10.75)	364.59 (12.82)	2~.O~

Table 3: Variable cost incurred/animal/year

Category of fanner	Green fodder (Rs.)	Wheat straw (Rs.)	Concentrate (Rs.)	Total feeding cost (Rs.)	Labour cost (Rs.)	Av. variable cost (Rs.)	Milk prod (1)	Cost per lit. milk (Rs.)
Rural subsistence	4413.05 (30.14)	888.39 (6.07)	2317.71 (15.83)	7619.15 (52.04)	7020.80 (47.96)	14639.95	3~ I.OX.~.26	
Semi-conunercial	4303.35 (31.90)	850.50 (6,31)	2243.09 (16.63)	7396.94 (54.84)	6091.61 (45.16)	13488.55	32UX.20	UO
Commercial	4213.83 (32.49)	809.83 (6.25)	2057.92 (15.87)	7081.58 (54.61)	5887.17 (45,39)	12968.75	33%.62	3.82
Overall	4353.00 (30.98)	866.69 (6,17)	2264.43 (16,12)	7484.32 (53.27)	6566.56 (46.73)	14050.88	~n5o.27	.uy

Table 4~ Average cost of milk production

Category of fanner	No. of farms	Fixed cost (Rs.)	Vcuiable cost (Rs.)	Total cost (Rs.)	Milk prod (1)	Cost/Lit (Rc;. 1
Rural subsistence	65	28ID.75 (16.44)	14639.95 (83.56)	17520.7 (HX))	3440.08	5.09
Semi-conunercial	45	2752.49 (16.95)	13488.55 (83.05)	16241.04 (100)	3208.20	5.06
Commercial	12	2988.48 (18.73)	12968.75 (81.27)	15957.23 (!(X))	3396.58	~.70
Overall	122	2844.04 (16.83)	14050.88 (83.17)	16894.92 (lOO)	3350.27	5.0

Figures given in parentheses indicate percentages.

Table 5. Economics of milk production

Category of fanners	No. of farms	Milk prod(l)	Pricellitre (Rs.)	Income from milk(Rs.)	.Total cost excl. FYM(Rs.)	Cost-benefit .ratto
Rural subsistence	65	3440.08	5.00	17200.40	17020.70	1:1
Semi-conunercial	45	3~.20	5.25	16843.05	15941.04	1:1.06
Conunercial	12	3396.58	5.50	18681.19	15607.96	1:1.19
Overall	122	3350.27	5.14	17214.23	16590.00	l:U»

REFERENCES

Anonymous. 1993-94. Federal Bureau of Statistics. Agricultural Statistics of Pakistan. MINFAC, Economic Wing, Islamabad.

Anonymous. 1997-98. Economic Survey. Finance Div., Economic Advisor's Wing, Government of Pakistan, Islamabad.

Ayub, M., Bakht B. Khan, S.H. Hanjra, KZ. Gondal and M. Yaqoob. 1990. Cost of production of buffalo and cow milk and its utilization in and around Muzaffargarh city. Pak. 1, Agri. Sci. 27(1)27-29.

Chaudhry, AM. 1970. Man, Water and Economy: Socio-economic analysis of fourteen rural communities in Mona project (WAPDA). West Pakistan Agricultural University, Lyallpur (Faisalabad).

Chaudhry, AM. and B. Ahmad. 1987. Cost of production of milk and beef in Bahawalpur district (1981-82). PARCB and Faculty of Agri. Econ. and Rural Sociol., Univ. Agri., Faisalabad,

Din, Z.U. 1984. Economics of livestock production in Dera Ismail Khan. M.Sc. Thesis, Univ, Agri., Faisalabad.

Goswami, S.A and N.A Rao. 1992. Economics of milk productin in the fast Khasi Hills district. Indian 1. Dairy Sci.45(2):8O-83.

Grover, D.K, P.L. Saukhayn and S.K Mehta. 1992. An economic analysis of milk production in Bathinda district of Punjab. Indian 1, Dairy Sci. 45(8):409-4.15.

Rao, B.D., T.G. Reddyand C.B. Singh. 1991. Economics of buffalo milk production on commercial dairy farms. Indian J. Dairy Sci. 44(1):15-19.

Tailor, S.P.,S.T. Borikar, L.S. lain and G.L. Chawala. 1992. Economics of milk production, in Surti buffaloes. Indian 1, Dairy Sci. 45(4):178-180.

Vasani, M.R., D.B: Kuchhadia and RL. Shiyani. 1992. Cost and returns of buffalo milk production in Rajkot district of Saurashtra. Indian Dairyman. 44(6):270-27~.