ISSN:0976-4933
Journal of Progressive Science
Vol. 01, No.02, pp 137-141 (2010)

Study on cost-benefit analysis of milk production in western part of U.P.

Dharmendra Singh* and R K Pandey

Department of Animal Husbandry and Dairying
Institute of Agricultural Sciences, B.H.U. Varanasi-221005, India

Abstract

The study conducted in western Uttar Pradesh with a view to analyzing the cost benefit and input –output relation in milk production on selected 50 dairy units were categorized onto I, II, III and IV on the basis of their ownership groups. It revealed that the average maintenance cost were Rs.31.48, Rs.35.00, Rs. 55.60 and Rs.43.03 per animal head per day and the input output ratio to total cost were 1:1.66, 1:1.47, 1:1.64 and 1:0.84 in the groups respectively. The percentage of break- even point have been estimated as 29.06, 98.63, 23.90 and 48.46 accordingly indicating no significant difference between groups .The organizational farm of IIIrd group receiving more net income as Rs. 21388.85 in compression to other dairies. It was also observed that the dairies having cows only receiving more returns in comparison to buffaloes and dairies having both species. Perhaps, it is due to the inclusion of more number of sahiwal crossbreds. Thus, Crossbreds were found more beneficial than indigenous cows in the study area.

Key Words- Milk production, cost-benefit, input-output relationship, net income, cross breds and indigenous cow

Introduction

Dairy farming in the country not only plays a vital role in eradicating poverty through generating employment and ameliorating financial stability of farmers but also contributes significantly in obviating protein mull nutrition. It once a subsidiary enterprise to agriculture has now became a measure enterprise and crop productions are being depended on dairying. Although dairying is by large in the hands of small and marginal land holders and agricultural labourers. About 80 per cent of farm family in India possesses cows and/ or buffaloes as a part of family. India one of the largest and fastest growing markets for milk and milk products is getting about 7.5 per cent growth annually in values terms. The country ranks first in milk production and it was 108.4 million tonnes in 2008 while 53.9 million tones during1990-91 was achieved duo to largest bovine population. The share of agriculture out- put to GDP was decreased, but in the same period share of livestock has increased. A growth rate of 4.5 per cent has been achieved by dairy sector during past decades as compared to the 2 per cent growth recorded by agricultural sector as a whole. India has the largest cattle and buffaloes population in the world. According to latest livestock

*Present address-Department of Animal Husbandry and Dairying, SMM Town P.G. College, Ballia- 277001, India
Email- dsingh7m@rediffmail.com

census the cattle wealth of country is 187 million constitutes about 39 per cent of total livestock population (482 million) and 98 million of buffaloes.

Uttar Pradesh ranks first in terms of milk production in the country. The western part is a most developed region of state. It occupies the western Ganga plains, which is well endowed with water resources and good climatic conditions favoured its agricultural and dairy development .It has been most benefited by the green revolution and operation flood-IInd which has made it the most developed agricultural and dairying region of state. It has been observed that the benefits of high yielding technology in agriculture have gone to large farmers having irrigation potential. Due to smaller resources endowments, small and marginal farmers were not able to benefit much from the advent of new high yielding technology. This resulted in under employment, low productivity and lower income. Dairying is no exception to these phenomena. The knowledge of absolute and relative profitability for each type of breeds becomes an important issue rational decision making on the farm. Cost and returns of milk production vary among different type of milch animals and also among breeds. It is immense important for farmers to know the the comparatives economics of milk production for cows and buffaloes to make a proper decision for choice of breeds and type of milch animals.

Materials and methods

The study conducted on dairy herds situated with central upland and plains of western Uttar Pradesh. 50 dairy farms of varying herd strength were choosen at random from the rural and urban areas of Lucknow, Agra, Meerat, Bareilly, Muradabad, Sitapur, Lakhimpur and Bijnour etc. districts in western Utttar Pradesh. Thus all dairy farms engaged in commercial production of milk were covered under the programme. For this purpose a questionnaire containing columns to record information about the description of units, herd statistics, data on animal housing, feed and feeding, breeding, milking, milk production performance and other, the herd information about various dairy operations i.e. cleaning of shed healthcare and hygiene and cost incurred on this entire item was prepared. Tabular and functional analyses were performed as the empirical tools on present study. All selected 50 dairy farms, were grouped onto trusted organizational, state government and privately owned dairy farms. According to the size and type of bovine different categories of animals also converted into standard livestock unit (SLU), that this will facilitate to workout norms for input cost.

Estimation of different input cost i.e. Feeding, breeding, healthcare, farm cleaning and sanitation, veterinary and medicine direct and indirect labour and on other miscellaneous items were estimated as variable components .The assessments of the capital investments made for the purchase of machinery equipment, for bovine maintenance ,construction of dairy buildings and sheds possessed by the units. The objective of present study is to develop milk production function in western U.P. and to devise the ways and means to implement such principle of management that will help in reducing the cost of milk productions and encouraging the farmers to uptake the dairy farming on scientific lines at low cost. In view of fact the milk production is affected by seasonality and various input factors, categories and breeds of animals. Therefore mathematical model of milk production function were adopted.

Estimation of production function using cost data

The mathematical form the production function depends upon the process and relationship between input and output, economic ,logic underlying such relationship through several forms of production functions Cobb Douglas model was used to derive the supply functions as-

Y=b x, b1 x2b2 eu

where Y=quantity of milk produced in litres

X1=fixed cost in rupees
X2=variable cost
B1and B2=regression coefficients
eu=random error that follows normal distribution means zero and constant variance.

The value of each input was added together to determine the fixed and variable cost for each dairy farm.

Determinants of profit

In order to identify the factors influencing the profit per litre of milk, regression technique was adopted. The alternative models were tried to using different sets of explanatory variables. The major inputs in production function of milk, green fodder, dry fodder and concentrates, the expenditure on these items to produce one litre of milk together with the fixed cost and price of milk were taken as explanatory variables.

π=f(x1, x 2, x 3, f, Py)
where π =profit per litre of milk
X1=value of green fodder per litter of milk
X2=value of dry fodder per litre of milk
X3=value of concentrate per litre of milk
F=fixed cost per litre of milk
Py=Average price per litre of milk
Since family labour is mainly used in milk production, the inputed value of the family labour was taken as a cost of production, this family labour would have gone waste. Hence, profit per litre of milk was ascertained by including labour cost.

Results and discussion

The findings enumerated from the study have been incorporated in table 1, 2 and 3 containing the information regarding the breed wise variation in relation to type of ownership, herd size, various cost components, returns, input-output ratio and break-even point etc. According to type of ownership all selected 50 dairies are categorized into four groups i.e. I (private), II (trustee), III (organizational), IV (Governmental). It was found in the study area that the crossbreds of Haryana with Holstein-Friesian (HF) and jersey (J) were very low in numbers in comparison to sahiwal crosses, this was perhaps due to dairy and dual purpose breeds of cattle. The indigenous breed sahiwal has maintained by all categories of dairies. Though the number of Haryana breed was less but it was maintained by I^{st}, II^{nd} and IV^{th} groups. Nevertheless the organizational group which include military dairy units were kept the highest number of sahiwal and their crossbreds with Holstein-Friesian(S*HF) as 234.23and 351.33 respectively, followed by Trustee i.e. 43.92only. The crosses of sahiwal with two exotic breeds HF and J were preferred by most of the owner-groups. A significant variation was estimated in groups for S*HF and S*J (Table-1) average maintenance cost of animals in I^{st} , II^{nd} , III^{rd} and , IV^{th} groups was showed in table.3 calculated as Rs15.60,Rs16.96,Rs 32.72 and Rs26.61 per animal head per day (Table-2). Costs calculated in terms of percentage were 76.79, 74.40, 80.02 and 72.49 for total

Table-1 Breed-wise herd statistics of adult stock

Group No.	Group description	Avg. No. of nits	Murrah buffaloes	Cross breds (S*HF)	Cross breds (S*J)	Cross breds (H*HF)	Cross breds (H*J)	Sahi-wal	Hary-ana	Desi / Gan-gatiri	Total No. of animal heads
1	Private	30	11.8	-	3.53	0.97	2.3	3.83	1.83	0.4	52.23
2	Trustee	13	3.38	43.92	14.92	-	-	28.69	3.54	1.31	220.38
3	Organisa-tional	3	-	351.33	-		-	234.33	-	-	1031.33
4	Govern-mental	4	53..75	-	43	-	8.75	29	5.5	-	393.75
Overall F	Average Value	50	12.26 8.56**	32,50 45.98**	9.44 2.46*	2.08 1.99**	0.58 0.21	26.14 37.00**	2.46 1.09**	0.58 1.26	182.02 34.93**

N.B.*,** Indicatessignificant at 5%(p>0.05),1%(p>0.01)level respectively.

Table-2 Deferent cost components of milk production per litre per head

Group No.	Group description	Avg. no. of units	Feed cost (Rs.)	Labour cost (Rs.)	Vet. cost (Rs.)	Misc. cost (Rs.)	Gross cost (Rs.)	Net cost (Rs.)	Maintena-nance cost (Rs.)/ hrad
1	Private	30	485.51	126.18	4.48	7.21	815.1	668.93	31.48
2	Trustee	13	2443.66	308.04	16.29	54.77	3738.02	3122.64	35
3	Organisa-tional	3	23991.92	3222	97.33	243.87	33746.48	31213.15	5.6
4	Govern-mental	4	4704.42	98	27.44	106.34	8512.57	7912.57	43.03
Overall F	Average Value	50	2742.52	4280.96	14.95	41.7	4166.74 38.14**	3719.04 40.33**	34.77 8.21**

N.B.*,** Indicates significant at 5% (p>0.05),1%(p>0.01)level respectively.

Table-3 Group-wise percentage of different cost components

Group No.	Group description	Avg. no. of units	Feed cost	Concent-rate cost (in total feed cost)	Labour cost	Vet. cost	Misc. cost	Water Charge (in total misc. cost)	Electricity charge(in total misc. cost)	Variabl-e cost	Fixe-d cost
1	Private	30	59.69	42.15	15.7	0.54	0.82	26.17	73.83	76.79	23.24
2	Trustee	13	63.07	41.5	9.5	0.47	1.36	23.05	76.95	74.4	25.6
3	Organisa-tional	3	69.81	59.12	9.19	0.27	0.75	16.68	83.32	80.02	19.98
4	Govern-mental	4	58.69	41.47	12.02	0.37	1.4	16.44	83.56	72.47	27.53
Overall F	Average Value	50	61.1 3.00**	42.94 1.06**	13.4 7.01**	0.49 6.64**	1 4.96**	24 5.52**	75.99 5.52**	75.99 1.21	24 1.27

N.B.*,** Indicates significant at 5%(p>0.05),1%(p>0.01)level respectively.

Variable cost and 23.24, 25.60, 19.98 and 27.56per cent for fixed cost respectively. Accordingly the overall cost of feed and labour account 61.10, and13.40 percent respectively (Table-3). Data

in table-4 indicated that the input-output ratio of total cost of returns in milk production in four groups has been estimated and the values were 1:1.66, 1:1.47, 1:1.64 and 1:0.84 and that of values of variable cost and output ratio were 1:2.19, 1:1.95, 1:2.07 and 1:1.19 respectively. The corresponding values for fixed cost and output ratio were 1:7.23, 1:6.3, 1:8.54 and 1:3.26 respectively indicating a significant difference between groups (Table-4) the means of percentage of break-even point have been calculated as 29.06, 98.63, 23.90 and 48.46 in groups respectively indicating that there is no significant difference between groups.

Table-4 Revenue received in terms of rupees and input-output ratio

Group No.	Group descriptioin	Avg. No. of units	Income from dung/ manure (Rs)	cow`s milk income (Rs)	buffalo`s milk income (Rs)	Total income from milk (Rs)	Gross income (Rs)	Net income (Rs)	Input - output ratio (Rs)	Variable cost - output ratio	Fixed cost - output ratio	Break-even point
1	Private	30	146.17	669.9	574.93	1244.83	1391	575.9	1:1.66	1:2.19	1:7.23	29.06
2	Trustee	13	675.38	4083.92	161.62	4245.54	4860.92	1122.9	1:1.47	1:1.95	1:6.30	98.63
3	Organisa-Tional	3	2533.33	52602	-	52602	55135.35	21388.85	1:1.64	1:2.07	1:8.54	23.9
4	Govern-Mental	4	600	4529.25	2345.75	6875	7475	-1037.57	1:0.84	1:1.19	1:3.26	48.46
Overall	Average	50	447	4982.22	574.64	5556.86	6004.56	1837.82	1:1.54	1:2.3	1:6.75	48.38
F	Value		15.52**	37.74**	7.95**	37.57	36.28**	31.92**	7.05**	5.49**	7.43**	1.01

N.B.*,** Indicates significant at 5%(p>0.05),1%(p>0.01)level respectively

Conclusion

Thus, it was indicated that the trustee forms were running on religious ground and therefore, they did not bother for profit earnings at the farm whereas the organizational farms are most scientifically managed followed by private governmental and trustee dairies. The gross income analyses as Rs1391.00, Rs 4860.92, Rs 55135.35, Rs7475.00respectively.The means of net returns in I^{st} , II^{nd} , III^{rd} and IV^{th} groups were Rs575.90. The dairies owned under the state government are running into loss and it is because of surplus labour including more supervisory staff. The study also revealed that dairies having cattle only are receiving more returns in comparison to buffaloes and both the species. This was perhaps due to the inclusion of more number of sahiwal crossbreed cows producing greater amount of milk. Thus cross bred were found more beneficial than indigenous cows.

References

1. Deepak Shah and Permatma Singh (1995) Resource productivity and resource use efficiency for milk production in Buland district of Uttar Pradesh, *Indian Journal of Animal Science*, 65(8) 921-929
2. Krishna C, (1997) Dairying for rural development, *Indian Journal of Rural Development* (3) 387-400
3. Meena,G.L.; Jain, O.K. and Chandel, B.S. (2010) Economics of milk production in alwar district of Rajasthan , *Journal of Dairying, Field and Home Science* 29(11)
4. Patel, R.P. (1993) Present status in promose of dairy in *Indian Journal of Agricultural Economics* XLVIII (1)
5. Rao, Neeraj and Prashant, Pol (2004) Economics of milk production in district Kanpur (Dehat), Uttar Pradesh. *Indian Journal of Economics*.(7)

Received on 12.10.2010 and Accepted on 9.11.2010