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COST BENEFIT ANALYSIS OF DAIRY FARMING IN NORTH INDIA

BY

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Abstract

Dairy farming has emerged as an important source of livelihood, particularly on small holder households. It play a significant role in generating gainful employment in rural sector, particularly among the landless, small and marginal farmers and women. It also form an important livelihood activity for most of the farmers who are supporting agriculture in the form of business. Animal husbandry supply income, offering employment opportunities and acting as an enterprise in large part of the country. The efficient management of dairy cooperative system has facilitated milk production and marketing in India. An attempt was made to analyze the milk contribution to dairy and cost benefit analysis of milk production in India. The data of the present study has been collected both primary and secondary sources and a cost benefit analysis has been.

Key Words – Animal Husbandry, Jersey Cow, Indigenous Cow, Cost-Benefit, Milk Man,

INTRODUCTION

Animal husbandry along with agriculture is an integral part of village dwellers. These activities have contributed not only to maintain nutritional level of the society but also to tie the man environmental relation very strong. Animal husbandry have played a prominent role in socio-economic development in an agricultural country like India.

Dairy farming is described as a small industry which provides gainful employment opportunities to the rural folk. It comprises about six per cent of the national income. Dairy industry provides not only full time but also regular income to the rural people. The contribution of livestock in income generation in the rural areas is quite substantial. Livestock contributes about 4.22 per cent to the GDP and agriculture contributes about 17.4 per cent in 2014-15. In the context of poverty and malnutrition,

milk has a special role to play for its many nutritional advantages as well as providing supplementary income to some 70 million farmers in over 500,000 remote villages.

Livestock production and agriculture are intrinsically linked, each being dependent on the other, and both crucial for overall food security. Livestock sector is an important subsector of the agriculture of Indian economy. It forms an important livelihood activity for most of the farmers, supporting agriculture in the form of critical inputs, contributing to the health and nutrition of the household, supplementing incomes, offering employment opportunities, and finally being a dependable “bank on hooves” in times of need. It acts as a supplementary and complementary enterprise.

The estimate of the milk production in 2015-16 is 155.5 million tonne and is likely to reach 133.7 Mt this year making a per capita availability of milk at national level has increased from 260 gram per day in 2007-08 to 337 gram per day in 2015-16 more than 265 g per day per capita recommended by World Health Organization (WHO). The proportion of buffalo, cows and goats in milk production is 51%, 45% and 4.0% respectively.

The population growth, urbanization, income growth, high income elasticity of demand and changes in food habits that fuelled the increase in milk consumption are expected to continue well into the new millennium, creating a veritable livestock revolution, environmental sustainability, public health and ethical concerns about the treatment of animals was launched in 1970. Its main thrust was to organize farmers’ cooperatives in rural areas and link them with urban consumers. Operation Flood has led to the modernization of India’s dairy sector and has created a strong network for procurement, processing and distribution of milk by the cooperative sector. In 1989, the Government of India launched the Technology Mission on Dairy Development (TMDD) program to support and supplement the efforts of Operation Flood and to enhance rural employment opportunities and income generation through dairying.

Economic analysis of dairy farming in mixed farming system provides basis for delineating possibilities of controlling costs of milk production and increasing returns to make it a viable enterprise (Bhowmik and Sirohi 2008). Per litre cost of milk production in urban areas is relatively high in comparison to rural and semi-urban areas, which may be due to higher feed, labour and fixed costs. The profit was estimated higher in semi-urban than urban and rural areas (Dutt *et al.* 2009). Gupta *et al.* (2009) reported that average milk yield per day; peak milk yield and age at first calving were found significantly associated with each other but varied with change in agro-climatic zones.

OBJECTIVES

1. To study investment, feeding and milk supply patterns on sample dairy farms.
2. To study the cost and returns of milk production on sample farms and,
3. To study the extent of adoption of recommended management practices and constraints faced in adoption on sample farms.

DATA BASE AND METHODOLOGY

For the present study, the data has been collected from both the primary and secondary sources. More than fifty milch animals of all categories from all farmers' classes were selected from the blocks of the district.

The collected data regarding cost components, milk production, consumption, investments and marketed surplus etc. were analyzed by using simple tabular analysis, averages, percentage and ratios. The cost and returns analysis was carried out on the basis of different cost concepts as given below:-

a) Analysis of data

i. Analytical techniques

a. Cost and Returns Analysis

The cost and returns analysis was carried out on the basis of different cost concepts as given below:-

Dairy farming costs (DF-costs) -

1. D-cost A = Cost of feed, fodder, concentrates, upkeep labour (hired), medicines, veterinary and other costs and depreciation on livestock, livestock equipments and cattle-shed.
2. DF-cost B = DF-cost A + interest on fixed investment on dairy animals, shed, equipments etc.
3. DF-cost C = DF-cost B + imputed value of family labour.

b. Dairy Incomes

1. Dairy Gross Receipts (DGR) = Value of milk + Value of dung.
2. Dairy Farm Business Income (DFBI) = D.G.R. – D – cost A.
3. Dairy Family Lab our Income (DFLI) = D.G.R. – D – cost B.
4. Dairy Net Income (DNI) = D.G.R. – D-cost C.

STUDY AREA

Bulandshahr, one of the important district of western Uttar Pradesh, lies between 28°4' to 28° 12' north latitude and between 77° 0' to 78° 0' east longitude and located in upper Ganga –Yamuna Doab (fig 1). The river Ganga separates it from Jyoti Ba Phule Nagar and Badaun districts. The district is bounded by Aligarh in south, Gautam Budh Nagar in west and Ghaziabad in the north. The district has 7 tehsils, 16 blocks, and covers an area of 4353 Sq. Kms. with a population **34,98,507(2011)**. The north to south length of the district is 84 km. while east to west width is 62 kms. Wheat, rice, sugarcane, maize and potato are the major crops which are grown in plenty .

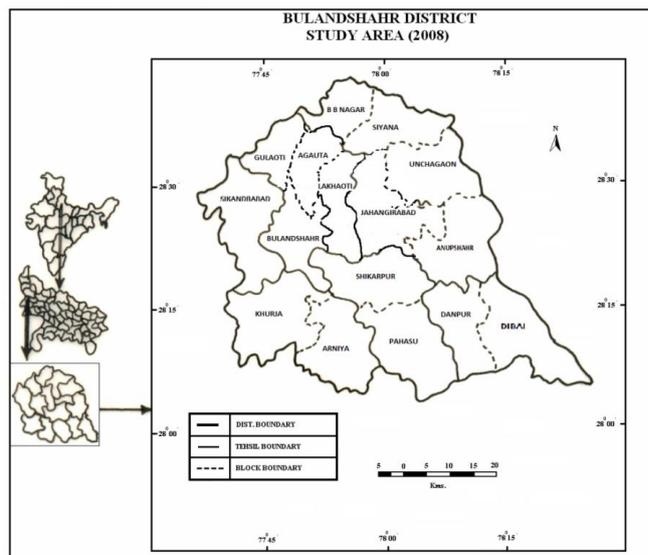


Fig. 1

Source- District Statistical Department of Bulandshahr

DISCUSSION

According to NSSO 68th Round (July 2011-June 2012) survey on Employment and Unemployment , 16.44 million workers as per usual status (Principal status plus subsidiaries status) were engaged in the activities of farming of animals, mixed farming, fishing and aquaculture (National annual report on livestock's).

India has vast resource of livestock. According to 19th livestock census, there were 190.9 million cattle (cows and bulls), 108.7 buffaloes, 65.07 million sheep and 135.2 millions goats. Tble.1 shows that the largest growth from 17th to 19th livestock census was recorded in case of the population of buffaloes which shows the economic importance i.e more milk productivity of buffaloes more than the other milch animals

Table :1 LIVESTOCK POPULATION IN INDIA

S. No.	Species	17 th Livestock Census 2003 (no. In millions)	18 th Livestock Census 2007 (no. In millions)	19 th Livestock Census 2012(no. In millions)	Growth Rate (%) 2007-12
1	Cattle	185.2	199.1	190.9	-4.10
2	Buffalo	97.9	105.3	108.7	3.19
4	Sheep	61.5	71.6	65.07	-9.07
5	Goat	124.4	140.5	135.2	-3.82

Source- Annual report on livestock 2016-17

India continues to be the largest producer of milk in world. Several measures have been initiated by the Government to increase the productivity of livestock, which has resulted in increasing the milk production significantly from the level of 102.6 million tonnes at the end of the Tenth Plan (2006-07) to 127.9 million tonnes at the end of the Eleventh Plan (2011-12). Milk production during 2014-15 and 2015-16 is 146.3 million tonnes and 155.5 million tonnes respectively showing an annual growth of 6.27%. The per capita availability of milk is around 337 grams per day in 2015-16. The production of milk and corresponding growth rate (%) per year from 1985-86 to 2015-16 is shown in fig.2.

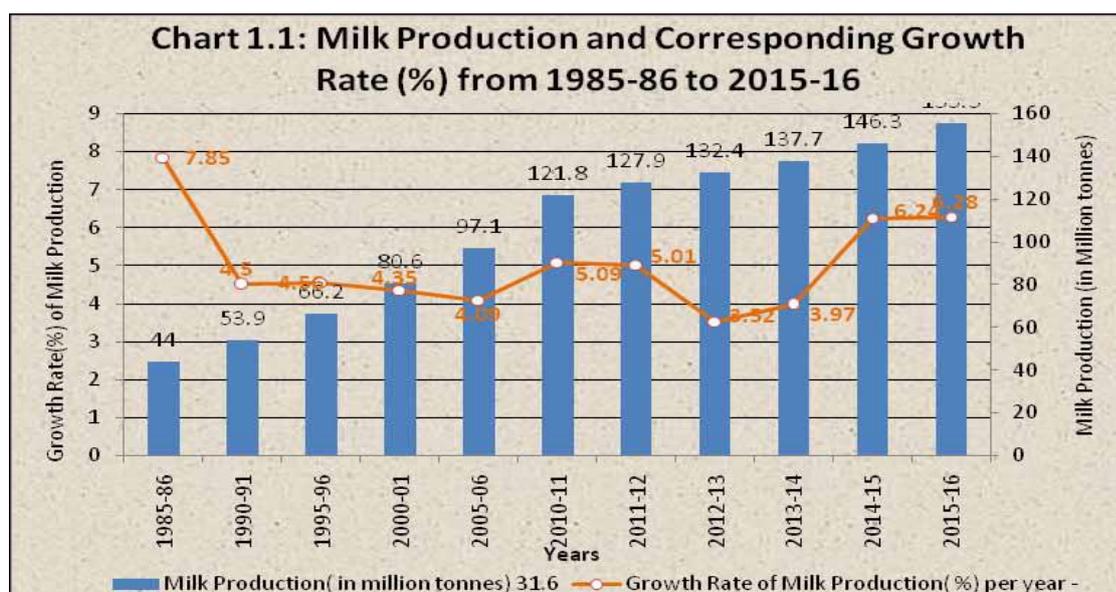


Fig. 2

Average yield rate for milk :- The average yield of milk per day per animal in milk at National level from different species during 2015-16 is given below:

Table:2 AVERAGE YIELD RATE FOR MILK IN INDIA (2015-16)

Exotic Cows (kg/day)	Crossbreed Cows (kg/day)	Indigenous Cows (kg/day)	Non-Descript Cows (kg/day)	Indigenous Buffalo(kg/day)	Non Descript Buffalo(kg/day)	Goat (kg/day)
11.21	7.33	3.41	2.16	5.76	3.80	0.45

Source- Annual report on livestock 2016-17

Table:3 COST COMPONENTS AND THEIR RELATIVE CONTRIBUTION TO THE GROSS COST OF MILK PRODUCTION IN DIFFERENT TYPES OF MILCH ANIMALS/LITRE

COST ITEMS	LOCAL COWS	BUFFALOES	CROSSBRE ED COWS	JERSEY COWS
Dry Fodder	10.6	11.3	9.4	11.3
Green fodder(Rs.)	3.56	3.9	4.3	5.2
Cakes and husk cost(Rs.)	5.03	8.74	8.21	10.7
Total feed cost (Rs.)	19.19	23.94	21.91	27.7
Labour cost of AI and veterinary services (Rs.)	0.27	0.74	1.08	2.13
Gross cost of production (Rs.)	19.46	24.68	22.99	29.83
Income from dung(Rs.)	1.32	1.34	1.48	1.33
Net production cost (Rs.)	18.14	23.34	21.51	28.5

Source- Field Survey 2017

COST BENEFIT RATION OF MILK ECONOMY IN STUDY AREA

a) Occupation

Table 1 shows the total number of cattle maintained, milch animals maintained, number of milch

animals maintained at different dairy farms. The table4 reveals that among 1 to 4 herd size 78.43 percent were milch and 21.57 percent were calf and male members, among 5 – 8 herd size 83.94 percent were milch while 16.06 percent were calf. Among the large herd sizes, the percent of milch animals is more than that of small herd size’s households. The socioeconomic characters of dairy owners have a profound influence on the decision-making process and profitability of dairy enterprise. The important socioeconomic characters are presented below:

Table: 4 Distribution of milch animals based on Herd Size

Herd Size	Households with milch animals			Dairy members	Animals in select households in %				Average daily milk contribution	Cost of milk production /litre
	Total House holds	% of milch animals	% of Calf and male animals		Local cows	buffaloes	Cross breed cows	Jersey Cows		
1 – 4	232	78.43	21.57	48	3.8	59.7	26.4	10.1	16.87	23.4
5 – 8	200	83.94	16.06	86	18.0	43.4	22.6	16.0	52.34	23.46
9 – 12	145	89.42	10.58	132	10.0	35.1	34.6	20.3	75.62	25.70
12 – 16	32	88.92	11.08	27	1.2	29.9	63.2	45.7	92.07	27.38
Above 16	15	88.47	11.26	15	2.1	57.6	3.1	40.2	103.46	27.79

Source- Field survey 2017

b) Maintenance cost

The result of maintenance cost of cow and buffalo of per animal for a year on different dairy farms are presented in Table 3. The result indicated that feed was the major cost components in total variable cost followed by labour cost. Among the feed and fodder item Dry fodder was the major feed items for all types of milch animals followed by concentrates. In relation to types of milch animals the higher quantity feed and fodder was fed to buffaloes by all dairy owners (Rs.23.94 per litre) followed by cross breed cow (Rs. 21.91 per litre) and local cow (Rs.19.19 per litre).

Cost on total variables was also recorded higher on buffalo followed by cross breed cow. Maintenance cost per dairy farm per year on various cost components is also presented in table 3. The study revealed that dry fodder and concentrates was the major cost components on all dairy farms. Green fodder accounted only of Rs.3 to 5 per litre in case of all cattle . Cost per litre was recorded minimum on dairy farm 1 to 4 and highest on dairy above 16.

c) Cost and returns from milk production

The average yield in litre per day of all type of milch animals is given in table 2 which shows that exotic cows give an average of 11.21 litre milk per day, and while cross breed cows give an average of 7.33 litre per day. In case of buffalo, on an average indigenous buffaloes have yield 5.71 litre per day while non descript buffaloes have their milk yield of 3.80 litre per day(annual report of livestock 2016-17).

Total cost and returns of per milch animal per year is presented in Table3. The analysis indicated that all breeds of milch animals maintained were profitable at all the dairy owners. The minimum returns per litre was recorded from 3.41 local cow to maximum 11.21 from jersey. The rate of milk vary from animal to animal and from milk man to direct supply to city dwellers and direct milk buyers from the farmer. Milk man get large profit than the producer because if the consumer get milk directly from producer, in that case producer sale milk on market price or more, on the other hand if the producers sell their to milk man, than a large proportion of the profit goes to milk man.

The price of buffalo milk(50 to 60 rupees per litre) are higher than cow milk (35 to 40 rupees per litre) whether it is jersey of indigenous cow.

So, the input–output ratio was also found minimum in local cow and maximum in buffaloes. The study reveals that the cross breed cows are more profitable even in comparison to local cows. Thus the study revealed that jersey cows generate large income on all dairy farms. The cost and returns per dairy farm was also work out by multiplying the number of milch animals maintained respective breed and cost and returns occurred on per milch animal and presented in Table 4. The total cost and quantity of milk yield per dairy farm depend upon the total number of milch animals maintained on each dairy farm. It can be observed that cost per liter (23 to 28) of milk production was not much differ among all the dairy farms.

The expenditure on wages paid to permanent and casual laborers engaged in various operations related to dairy animals was obtained from milk producers. The value of hired labour was considered at prevailing market rate paid by the milk producers

This implies that there was a need to create awareness among dairy farmers about benefits of green fodder in milk production. It is also suggested to include promotion of green fodder production as an important component of strategies in future milk production policies of the state.

CONCLUSION AND SUGGESTION

Study revealed that cost of milk production can be considerably reduced, if producers are supplied with relatively cheap balanced ration. It is quite possible by replacing some of the costlier ingredients by relatively cheaper feed like maize, barley, oat, linseed, sunflower cakes and molasses. Secondly, farmers should be motivated to adopt balanced ration for their animals utilizing larger quantities of quality green fodder thereby reducing the quantum of concentrate. Dairy farmers should also be advised for meeting requirements of feed by providing desired nutrients through feeding of green fodder which not only reduces intake of concentrates but also helps in reducing cost of production. Treatment of dry fodder with

urea helps in improving its nutritive value, and such technologies may be popularized to make feeding balanced and cost effective. Herd-size and type of milch animal along with parity significantly influenced cost of milk production. Production cost may gradually decrease with increase in size of unit.

India ranks first in milk production, accounting for 18.5 % of world production, achieving an annual output of 146.3 million tones during 2014-15 as compared to 137.69 million tonnes during 2013-14 recording a growth of 6.26 %. Whereas, the Food and Agriculture Organization (FAO) has reported a 3.1 % increase in world milk production from 765 million tones in 2013 to 789 million tones in 2014. The per capita availability of milk in India has increased from 176 grams per day in 1990-91 to 322 grams per day by 2014-15. It is more than the world average of 294 grams per day during 2013. This represents a sustained growth in availability of milk and milk products for the growing population. Dairying has become an important secondary source of income for millions of rural households engaged in agriculture. The success of the dairy industry has resulted from the integrated co-operative system of milk collection, transportation, processing and distribution, conversion of the same to milk powder and products, to minimize seasonal impact on suppliers and buyers, retail distribution of milk and milk products, sharing of profits with the farmer, which are ploughed back to enhance productivity and needs to be emulated by other farm produce/producers.

Suggestions and Policy implications

1. There is need to motivate dairy owners for adoption of scientific management practices in rearing of milch animals for better health and performance.
2. In the context of various production traits Jersey cows were more superior than buffalo and local cows. Hence, emphasis should be given towards increasing herd strength with these breeds.
3. There is an imperative need to give recommended doses of feed and fodder to increase milk production.

Farmers have been advised to expand, intensify and 'modernise' their production by replacing local breeds with high-producing exotic milk breeds to enhance production and to decrease their costs of production through expanding herd sizes. Despite the fall in procurement volumes and prices, government development programs continue to promote dairying and finance farmers with loans to purchase high-yielding milch animals. This approach pushes small farmers to specialise and intensify production, then get trapped into debt and finally lose their livelihoods. There is little chance of their being able to go back to dairy farming thereafter.

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