

## Factors in Economics of Milk Production on Commercial Dairy Farms in Aravalli District of North Gujarat

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### ABSTRACT

*The present research study was under taken in Aravalli district of North Gujarat. Ex-post facto research design was used for the study. The four talukas namely Modasa, Malpur, Bayad, Dhansura were selected purposively. The research study was under taken with broad objective to assess the economics of milk production on commercial dairy farms and find out its relationship with selected personal and socio-economic attributes of commercial dairy farm owners. Economic analysis revealed that the expenditure on total feed and fodder was the highest among all components of gross cost. The Net cost of milk production per liter was found as Rs. 21.78 and net income per liter was found as Rs. 4.96. The correlation coefficient analysis revealed that the adoption and economic motivation were the positive and highly significant variables, while training received, knowledge and extension participation exerted positive and significant effect on economics of milk production.*

**Key words:** Commercial dairy farm; Economic analysis; Cost of milk production; Aravalli district;

Livestock sector is emerging as an important growth leverage of the Indian economy. As a component of agricultural sector, its share in gross domestic product has been rising gradually. In recent years, livestock output has grown at a rate of about 5 percent a year. This enterprise provides a flow of essential food products, draught power, manure, employment, income, and export earnings. Milk is the largest crop in terms of value. It's valued at around Rs 6.5 lakh crore, which is more than the total value of wheat and paddy put together. Distribution of livestock wealth is more egalitarian, compared to land. Hence, from the equity and livelihood perspective it is considered an important component in poverty alleviation programmes.

From a milk scarce nation, now India has emerged as highest milk producing country with a sizable quantity of milk production and it is on continuous rise. India's decadal milk production growth pegged at 4.8% CAGR, is twice that of global milk production, which is growing at 1.8 per cent CAGR. In the past five year, this has improved even more to 5.4 per cent CAGR.

In India, dairy farming has been practiced as a mix farming and as a traditional small holder's enterprise but in last one decade or so there has been considerable increase in number of organised farms, more and more commercial dairy farms have come up and their numbers are on continuous rise. The livestock farming has become a more professional business. North Gujarat is leading region with number of milch cattle and buffalo and also leading in milk production in the state. In this region numbers of commercial farms are also on rise since last one decade. Minimizing unit cost with judicious management would trigger the profitability and success and sustainability of dairy farm business. In the present study, it has been envisaged to find out profitability of organised dairy farms and factors associated with commercial dairy farms in Aravalli district of North Gujarat. The present study was under taken with following objectives:

1. To find out the economics of commercial dairy farms
2. To find out factors associated with economics of commercial dairy farms.

## METHODOLOGY

The present study was carried out on commercial dairy farms in four taluka of Aravalli district. Since Aravalli is a newly constituted district, having good number of commercial dairy farms and no such study was under taken so far. Forty commercial dairy farms were selected by simple random sampling. The data was collected by structured personal interview schedule. The respondents were contacted on their farms. Total 80 interview schedules were processed for final data analysis. The structured interview schedules included range of questions including personal attributes of farmers like age, education level, types of occupations, commercial dairy farming experience, knowledge and adoption of improved animal husbandry practices and extension participation while questions on socio-economic characters comprised of herd size, milk production, land holding and economic motivation.

Economics (profitability) of milk production of cattle and buffaloes was estimated as per the standard procedures as : (A) Fixed cost and (B) Variable cost.

The fixed cost included interest on fixed capital and depreciation cost on shed, animals and equipments present on farm. The variable cost included cost of green fodder, dry fodder, concentrate, labour, veterinary charges, miscellaneous charges (AI, transportation, electricity and other charges if any.). As the commercial dairy farm maintained animals of different species-breeds and of different age groups so, the livestock maintained at the farm was converted into Standard Animal Units (AU's) as per the methodology suggested by *Kumbhare, et al. (1983)*.

Profitability of commercial dairy farm was taken as dependent variable and socio economic factors taken as independent variables. To find out association between dependent variable and independent variables the data were fit to Pearson's correlation coefficient analysis.

## RESULTS AND DISCUSSION

It is apparent from Table 1 that average gross cost and gross return per AU per day was Rs. 123.00 and Rs. 144.13 respectively. Regarding different components of gross cost, expenditure on total feed and fodder was highest, which was 73.77 per cent, followed by total fixed cost (interest on fixed capital+ depreciation on fixed assets) 15.33%, labour cost (7.61%), veterinary expenses (1.69%) and miscellaneous expenses (1.59%). It was

**Table 1. Different cost of maintenance on commercial dairy farms**

Items of expenditure	Cost per AU/day
<i>Fixed Cost</i>	
Interest on Fixed Capital	7.45 (6.06)
Depreciation on fixed assets	11.40 (9.27)
Total fixed cost	18.85 (15.33)
<i>Variable Cost</i>	
Green fodder	15.64 (12.71)
Dry fodder	12.69 (10.32)
Concentrate	62.41 (50.74)
Total feed and fodder cost	90.74 (73.77)
Labour cost	9.36 (7.61)
Veterinary expenses	2.08 (1.69)
Miscellaneous expenses	1.97 (1.60)
Gross Cost	123.00 (100.00)
<i>Returns</i>	
Returns from dung	5.61
Net Cost	117.38
Sale price of milk (Rs./litre)	26.74
Milk production (litres)	5.39
Gross return	144.13
Net Return	26.74
Cost per litre of milk (Rs./litre)	21.78
Net Returns per litre (Rs./litre)	4.96

Figures indicates per cent of the respective value.

also revealed that the concentrate alone contributed about half of the total gross cost.

It can be concluded from Table 1 that it is necessary to cut down the cost of feed and fodders by way of making homemade concentrate with available resources. They can even be purchased from market when they are surplus in the market and available at low price. Preserving the green fodder by making silage and use it in time of scarcity, using urea treated fodder that can add to availability of more nutrients; all these practices help commercial dairy farmers to drop down the cost on feed and fodder and ultimately increases the profit level. The expenditure incurred as total fixed cost was about 16.00 per cent of the gross expenditure. In present scenario, there are also special provisions for farmers from the government that farmers can avail the loan facilities even at lesser rate than the prevailing interest rate of the banks; these factors would also add to profit margins of the farms. These all lead to conclude that dairy farming business has great potential to earn profit and generate employments in the present days.

The more or less similar expenditure pattern was also found by *Chandra and Agrawal (2000)*, *Chand et al. (2002)*, *Parmar et al. (2010)*, *Singh et al. (2011)*, *Ghule et al. (2012)* and *Manjunatha and Umamageswari (2013)*.

It is obvious from Table 1 that returns from dung and milk per AU was Rs. 5.61 and Rs. 144.13 respectively. Milk contributed 96.25 per cent and dung contributed 3.75 per cent of total return. Net return per liter per AU per day was found to be Rs. 4.96. Cost benefit ratio was 1:1.22. *Shiyani et al. (1982)* reported the similar result.

**Table 2. Relation between characteristic of commercial dairy farm owners and economics of commercial dairy farms**

Independent variables	Correlation coefficient (r)
Age	-0.109 <sup>NS</sup>
Education	0.190 <sup>NS</sup>
Occupation	0.04 <sup>NS</sup>
Commercial dairy farming experience	0.088 <sup>NS</sup>
Training received	0.363*
Knowledge	0.358*
Adoption	0.594**
Extension participation	0.388*
Herd size	0.22 <sup>NS</sup>
Milk production	0.270 <sup>NS</sup>
Size of land holding	-0.036 <sup>NS</sup>
Economic motivation	0.555**

\*\*Significant at 1.00% level of probability,

\*Significant at 5.00% level of probability,

NS=Not-significant.

It is evident from the Table 2 that out of the 12 variables, the correlation coefficient of 10 variables were found to be positive and two were found to be negative. Out of ten positively related variables two variables namely adoption and economic motivation were found significant at 0.01 level of probability and other three variables namely knowledge, training received and extension participation were found significant at 0.05 level of probability. The variable viz. education, occupation, commercial dairy farming experience, herd size and milk production were positively correlated but were non significant same way two variable age and land holding were negatively correlated but were non significant.

*Age and economics of commercial dairy farms* : Age of commercial dairy farm owners was negatively but non significantly correlated with economics of commercial

dairy farm. In fact majority of commercial dairy farm owners were middle aged, these might be a reason that age was not found to be a differentiating factor in their profit making ability secondly it was negatively associated indicating that in old age individual are reluctant to change their practices leading to a negative relation but their number were less so influenced non significantly. *Cicek et al. (2007)*, *Nyekanyeka (2011)*, *Mumba et al. (2012)*, *Mohammed et al. (2013)* and *Masuku (2014)* were equivocal in reporting that age did not influence the economics of dairy farming. Findings did not support the findings of *Nwachukwu and Onyenweaku (2007)*, *Nganga et al. (2010)* and *Kashfi et al. (2012)* who observed that higher aged people had more experiences leading to increase in profitability as well.

*Education and economics of commercial dairy farms* : Education of commercial dairy farm owners was positively but non significantly correlated with economics of commercial dairy farms. It could be concluded that there was no influence of education in economics of commercial dairy farm. Education is universal remedy to all community maladies. Education widens the horizons of observation of a person to the socio-economic circumstances. Well-educated person understands the utility of innovations and adopts the technology without stipulation. They have more faith in research results, generally have broader outlook and capacities to realize and interpret the innovations, resulting in better result but in this study all the respondent farmers were well educated i.e. they were not significantly different in their education level resulting it's positive but non significant and non differentiating effect on economics of commercial dairy business.

This finding is similar to the finding of *Nwachukwu and Onyenweaku (2007)*, *Mohammed et al. (2013)* and *Masuku (2014)*. This result is not line with result reported by the *Cicek et al. (2007)*, *Nganga et al. (2010)*, *Nyekanyeka (2011)* and *Mumba et al. (2012)*.

*Occupation and economics of commercial dairy farms*: Occupation of commercial dairy farm owners was positively but non significantly correlated with economics of commercial dairy farm. It can be concluded that different number of occupations undertaken by commercial dairy farm owners did not affect the profitability of commercial dairy farm. It may possible that commercial dairy farm owners might have considered commercial dairy farming as an important source of earning, giving due attention on the business.

Secondly these may be due to their involvement pattern in different occupation, as it is evident that majority of commercial dairy farm owners were having agriculture and commercial dairy farming as their main occupation i.e. they all were practically in same category as far as their occupation was concern leaving its positive but non significant role on economics of commercial dairy farm.

*Commercial dairy farming experience and economics of commercial dairy farms :* Commercial dairy farming experience was positively but non significantly correlated with economics of commercial dairy farm indicated that formal commercial dairy farming experience did not increase the economics of commercial dairy farm.

Infect, in Gujarat dairying is not only familiar and ancestral occupation but also deemed an art pursued with emotional involvement. Thus, commercial dairy farm owners often evolve their own packages of practices and homemade remedies that confirming to their logic and intuition there by resisting any practice alternative from their point of vision. Refusal of earlier weaning and quick servicing is the considerable examples. This may be because the livestock keeping is in their blood since ancestral time. Their parents and grandparents were also keeping animals so more or less they have practically equal exposure to livestock keeping resulting in no significant effect on economics of commercial dairy farm. These results are in compliance with *Kashfi et al. (2012)* and *Mohammed et al. (2013)*.

However it is not in line with the result reported by *Nwachukwu and Onyenweaku (2007)*, *Nganga et al. (2010)*, *Nyekanyeka (2011)* and *Masuku (2014)*.

*Training received and economics of commercial dairy farms:* Training received by commercial dairy farm owners was positively and significantly correlated with economics of commercial dairy farm. The rationality behind this would be the training on dairy farming makes people more aware of the scientific practices and ongoing technological changes. This would help them to acquire information regarding breeding management, feeding management, health care management and other information pertaining to improve dairy farming. This result is in accordance with the findings of *Stup et al. (2006)* and *Sharma et al. (2014)*.

*Knowledge and economics of commercial dairy farms:* Knowledge of commercial dairy farm owners about improved animal husbandry practices was positively and significantly associated with economics of commercial

dairy farm. The better aware commercial dairy farm owners about improved animal husbandry practices better would be their management practices resulting in increased economics of commercial dairy farm.

Knowledge influences interest and understanding. It widens the mirage and develops foresight of an individual. Exposure to latest technical expertise enables to arrive at a favourable conclusion regarding more profitability. Thus, knowledge fortifies economics of commercial dairy farm. *Mande et al. (2008)* and *Biswas et al. (2012)* also concluded same result in their research. *Adoption and economics of commercial dairy farms:* Adoption of improved animal husbandry practices by commercial dairy farm owners was positively and highly significantly associated with economics of commercial dairy farm.

Since adoption is an action that involves the use of means for attainment for certain goals. By way of adoption of improved animal husbandry practices, farmers convert their knowledge into action and use new technology which would reflects in better labour utilization, saving milk from spoilage, feed and fodder from wastage and improving yield per animal per lactation and thereby increasing profitability of farms. The results are in compliance with the *Carley and Fletcher (1986)*, *Quddus (2012)* and *Ashraf et al. (2013)*.

*Extension participation and economics of commercial dairy farms :* Extension participation of commercial dairy farm owners was positively and significantly associated with the economics of commercial dairy farm. Extension participation would provide an impetus to critically watch the modern dairy farming practices in the field. Farmers' by way of participation in field visit, progressive farmer's dairy farm, exhibition etc. would facilitate them to observe the field condition or practical utility of modern practices enabling them to improve adoption, resulting in more production and more profit leading to positive influence of extension participation on economics of commercial dairy farm. Present result is in line with the *Nyekanyeka (2011)*, however, it is not in accordance with the finding of *Nwachukwu and Onyenweaku (2007)*.

*Herd size and economics of commercial dairy farms :* The herd size was positively and non-significantly correlated with the economics of commercial dairy farm. The increasing number of milch animal tends to increases the annual income but in present study it didn't affect the economics of farm, might be because of it concern with input: output ratio which could have nullified the

positive effect of herd size. This leads to conclusion that, increased herd size could not exert significant influence on profitability of commercial dairy farms.

Similar result also reported by *Dhuyvetter (2011)*, while result reported by *Cicek et al. (2007)*, *Nwachukwu and Onyenweaku (2007)*, *Kashfiet al. (2012)*, *Mumba et al. (2012)*, *Winsten et al. (2012)* and *Masuku (2014)* are not in accordance with present findings.

Milk production and economics of commercial dairy farms: The total milk production on commercial dairy farm was positively and non-significantly associated with the economics of commercial dairy farm. The average milk production on all the dairy farms was more or less same. With increased production per unit cost should come down but result showed that this was not the case in this study. This leads to conclusion that though milk production influenced positively but not significant, means the management practices on farms where total milk production was high, needs still improvement to take benefit of more milk production.

*Size of land holding and economics of commercial dairy farms:* The size of land holding possessed by commercial dairy farm owners was negatively and non-significantly associated with the economics of commercial dairy farm. Land is one of the most fundamental resources and considered as an important socio-economic indicator in agricultural sector and rural development. Commercial dairy farmers with more hectare of land would have more substantial visible capital earning from agriculture, this would have made them less attentive to commercial dairy farming resulting in negative impact on economics of commercial dairy farm. The present finding is not in

support with the *Kumar and Tripathi (2011)*.

*Economic motivation and economics of commercial dairy farms :* Economic motivation of commercial dairy farm owner was positively and highly significantly correlated with the economics of commercial dairy farm. This might be because of economically motivated commercial dairy farm owners were naturally oriented towards maximization of returns from the dairy farming. They might have accepted commercial dairy farming as a profitable enterprise and tend to increase economics of commercial dairy farm. Same result also reported by *Kumar and Tripathi (2011)*.

## CONCLUSION

The study has clearly shown that there is a much more potential in commercial dairy farming business. The cost of feed and fodder play a major role in cost of milk production. More training programmes should be initiated to educate the farmers about ration balancing which would result in decline in the cost of production of milk and improve milk productivity and profitability. The correlation coefficient analysis clearly revealed that the variables namely adoption and economic motivation had positive and highly significant effect, while training received, knowledge and extension participation had positive and significant effect on economics of commercial dairy farms. Extension agencies should organize knowledge building activities like group meetings, group discussions and impart training to influence farmers to adopt the scientific practices. Adoption of scientific practices on farm will substantially help in increase of production as well as income generation.

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