



International Journal of Research in Academic World



Received: 20/June/2024

IJRAW: 2024; 3(7):191-195

Accepted: 26/July/2024

Viability of Dairy Farming in Assam: A Case Study of Morigaon District

*¹Dr. Abu Jafor¹Senior Assistant Professor, Department of Economics, South Salmara College, Assam, India.

Abstract

To resolve the overall food, health and education problems occurring in the world today, international development goals were set that are directly or indirectly associated with livestock sector, even more to dairy farming (DFID, 2005). India is endowed with the largest livestock population in the world. Thus, there is a tremendous potential for increasing the milk production through profitable dairy farming. The dairy farming is an important enterprise that provides employment, income and nutritive food for millions of rural families and also supplies cow dung as organic manure to enrich the soil fertility and thus help in increasing crop production. Assam, with vast natural endowment, has the enormous potentiality for the development of dairy sector. A recent study conducted by International Livestock Research Institute (ILRI) revealed that dairy farming is a viable option in Assam for raising incomes and improving livelihood opportunities particularly for the rural poor.

With this backdrop, we attempt to explore the feasibility/viability of dairy farming in the proposed study area by employing gross margin analysis. This study has received considerable attention as it gives pertinent information for making sound management decision in resource allocation and also helped in improving quality of life of the rural public apart from employment generation amongst the rural poor.

Keywords: Dairy farming, gross margin, viability, Assam

1. Introduction

To resolve the overall food, health and education problems occurring in the world today, international development goals were set that are directly or indirectly associated with livestock sector even more to dairy farming (DFID, 2005). As income increases with economic development, the share of animal products in total food budget increases faster than that of cereals, the elasticity of demand for livestock products is three to five times higher than that of cereals (FAO 2009). This occurs because of the relatively high-income elasticity of demand for animal products (Ehui S. 2008) [4].

Milk has been described as nature's most perfect food, as it is the sole source of nourishment for newborn mammals (Schmidt *et al.*, 1988) [19]. It is very important in the human diet because of two important ingredients namely protein and calcium. Dairy products provide the most important amino acids required for body building as well as tissue repairs in human beings (Osoimehin *et al.*, 2006) [15]. Milk also contains essential vitamins and minerals. There is some evidence that milk and milk products exhibit a cholesterol lowering effect thus preventing incidences of atherosclerosis and coronary heart disease (Schmidt *et al.*, 1988) [19].

The demand for livestock products, especially for milk and meat, in India has increased considerably in the recent past, and has strong potential for further growth. Several socioeconomic indicators underline this trend. Empirical evidences show that the composition of the food basket of an

average Indian is gradually shifting towards livestock products (Radhakrishnan and Ravi, 1990; Kumar, 1998).

In Assam, dairying is characterized mostly by rural smallholder's production using indigenous cattle and buffalo, with pockets of specialized dairy production using improved dairy cattle in the peri-urban areas and in certain rural zones having better market access. There is an emerging dairy industry based on milk produced by low-yielding local (desi) cattle and increasingly by high yielding dairy cross-breeds, which are currently managed by only a few cattle-keeping households.

The dairy production system in Assam can be broadly categorized into traditional and stall-fed system. Prior to the second five year plan dairy activities was under taken by small produces in milk shed (Khuti) which was concentrate in the Brahmaputra valley or in hilly terrain away from urban areas. Milk production in these milk sheds areas was mostly used for the preparation of Dahi (curd) or ghee which was sold in the nearest market at whatever price offered to them. The most distinctive feature was that majority of the cattle-breeders were of Nepali origin and to a lesser extent from Bihar. These cattle breeders have contributed greatly for the development of dairy farming in Assam.

There is progressive development in dairy activities in and around Sitajakhla areas of Mayang development block of Morigaon. Today the farmers of Amlighat area are producing around 14000 to 18000 liters of milk per day. This area is very rich in cattle population and has a big scope for milk

production and to earn their livelihood. Earlier the farmers in these areas were started milk production with local cows but later switched over to crossbred cows and milk production increases substantially.

With this backdrop, the present study aims to assess the economic viability of dairy farms in Morigaon district. The present study assumes relevance as the findings of the study might be helpful to understand the viability of dairy farms and for policy formulation purposes.

2. Data Source

The survey collects cross sectional data and made use of both primary and secondary data. Primary data were collected through personal interview with the dairy farmers included in the sample. A semi-structured questionnaire was designed to obtain information from the respondents regarding the socio-economic and farmer characteristics to be answered in the interview. All the data collected for the study pertains the year 2018-2019. In this study Morigaon district was selected because of significant dairy activity and are the major sources of liquid milk supply to the processor as well as to the urban consumers in the capital of the state. In this study a total of 160 dairy household were selected from eight villages purposively. The information collected included quantities of variable inputs used and cost per each variable inputs, level of milk production, herd size and socio-economic characteristics of the respondent farmers. The collected information was first tabulated, coded and entered into computer for analysis. And final analysis was done using computer software packages. (SPSS). Secondary data were collected from previous documents, previous research findings on dairy production in the country.

3. Necessity of the Study

The rationale for economic analysis in smallholder dairy farming arises from the fact that resources in a dairy enterprise namely human resource, facilities, equipment, raw materials and others, are all scarce commodities. This means that choices have to be made about where to deploy these scarce resources. Economic evaluation/analysis provides a scientific and systematic method for making these choices (Zweifel *et al.*, 2009). Research based information on economic analysis of the relative profitability of smallholder dairy farming is lacking in India and more especially in Assam. The findings from this study will therefore provide baseline data for policy makers, development planners and farmers when making decisions related to the profitability of smallholder dairy enterprises in the study area. It is also important in issues relating to farm-level decision making, policy and government program evaluation and resource allocation to smallholder dairy farming.

4. Methodology

Economic analysis is necessary in assessing the viability of agricultural enterprises. There are different methods such as cost benefit analysis, gross margin analysis, partial budgeting analysis, cost effective analysis and cost utility analysis that can be used to assess the viability of dairy enterprises (Ndambi *et al.*, 2008; Dijkhuizen and Huire 1997; Zweifel *et al.* 2009) [14]. This study used gross margin analysis to calculate profits of dairying at an individual farm level due to the fact that it is the simplest and most practical method of assessing economic viability and it is widely used in farm management economics (Dijkhuizen and Huire 1997).

Gross margin is defined as the difference between the value of an enterprise's gross output and variable costs (Ergano and Nurfeta, 2006) [5]. Variable costs refer to those costs which vary directly according to the level of production of dairy cow. The gross margin analysis was used to assess the viability of dairy farms.

The following formula was used to calculate the gross margins:

$$GM=GR-VC \quad (1)$$

Where, GM is gross margin per cow.

GR is gross revenue calculated as the product of price per unit of output and the amount of milk produced.

VC is variable costs associated with milk production.

The gross revenue included the value of milk sold to different market channels and consumed by the household. Milk consumed at home was valued by multiplying the volume of milk consumed at home per year and the average price. Dairy farms variable costs including feed (concentrates), feed (supplements) veterinary cost, artificial insemination (AI) and labor (hired) costs were calculated based on market prices.

In order to achieve this objective, information on the following variables were collected. These were quantity of milk produced per farm per year, number of lactating dairy cows per farm per year and price of milk in rupee per litre sold to different marketing channels. This information enabled the quantification of the total revenue (TR). Non-marketable benefits such as manure were not quantifiable in this study. The analysis did not include the value of animals at the beginning and end of the year as this data was not readily available.

The major variables which were necessary for the quantification of the total variable costs (TVC) were; cost of feeds, veterinary services, labour, drugs and artificial insemination. The variable cost of feeds consisted expenditure on rice bran, wheat bran, vitamin and minerals. Information about prices in (Rs) and quantity in (kg) on these feed variables were collected from each dairy farmer and were used to compute the average farm feed cost per farm as well as per cow. Fixed costs were ignored in this study because they are unrelated to higher levels of milk production and they do not affect optimal combination of variable inputs in smallholder dairy production (Mburu *et al* 2007; Mumba *et al* 2012) [7, 12]. Only casual labor was captured in the study due to difficulties in measuring the exact family labor involved in dairying.

Recent Studies which Used Cost benefit and Gross margin analysis to assess viability of dairy farms:

Cost-benefit analysis is a financial appraisal of an activity that compares all cost and benefits that go into the production process. Measuring the cost and benefits of production is important if a farmer wants to know whether he is making profit. While one can tell the price of milk right away, it is often difficult to measure production costs and profits (Bailey, 2001). Estimation of economic returns plays a very important role in influencing farmers' choice to adopt a new technology and consequently influences their resource management decisions (Bamire *et al.*, 2003). The understanding of costs and benefits is also an important prerequisite for policy formulations aimed at improving productivity levels.

Different scholars used cost benefit analysis to measure smallholder farm profitability. Mburu *et al.* (2007) [7] used cost benefit analysis to compare the profitability of

smallholder dairy production in different agro ecological zones in Kenya highlands.

Mdoe *et al.* (1997) [8] conducted a benefit-cost analysis to examine returns to smallholder dairying in the Kilimanjaro region of Tanzania. Results showed that the returns to dairying were around 20%. There was no difference in returns between large scale farmers and small-scale farmers with potential lower stock. The cost benefit calculation was also used to generate summary measure of Internal Rate of Return, and Net Present Values. The benefit cost ratios were almost identical across scale groups, despite the marked differences in the intensity of spending on feed.

Gross margin is the difference between the value of an enterprise's gross output and variable cost of production Johnson (1982) [6]. Gross margins are used to evaluate economic viability of an enterprise. They are used in agriculture for farm planning and comparing different farms with similar characteristics or different enterprises on the same farm (Chamdimba, 2007) [2].

By using gross margin analysis, Somda *et al.* (2005) [17] examined the economic viability of milk production in smallholder farming systems in Gambia. The results showed that smallholder dairy farming in Gambia was indeed viable. The study also established that profitability varies across groups based on the scale i.e. medium-resource group and resource poor farmers. Viability was higher in resource medium group than in resource poor group. This implies that smallholder dairy farmers have different resource endowments which affect profitability.

Using gross margin analysis, Mwangi (1981) [13] studied the economics of milk production in smallholder farms in the Kenyan highlands. He collected data on inputs used in milk production and estimated a milk production function. His results revealed that most of the dairy producers in the Kenyan highlands were making good profits from milk production. His results estimated dis-economies of increasing herd size; implying that the best approach to increasing milk production was to improve dairy management practices.

Mumba (2012) [12] investigated the viability of dairy farming in Zambia and the results revealed that smallholder dairy farming is viable in Zambia. The researcher used gross margin analysis in this study.

Work done by Mlay (1989) [11] on the economics of smallholder dairy production in Hai District, Tanzania; using gross-margin (Sturrock, 1971) [18] and return to investment analyses, were used to assess economic impact of some proposed technologies.

Using gross margin analysis Kawambwa *et al.* (2014) [16] carried out a study in Wageningen on business viability of dairy farms and found that smallholder dairy farming is profitable but the cost of concentrate feed, veterinary drugs, labour costs are threatening the viability and profitability of the farming practices.

Mwale *et al.* (1999) [10] analyzed economic feasibility of smallholder dairy farmers using Malawi Zebu and its crosses for dairy in Mzuzu Milk Shed Area. The results suggested inter-linkages between genotype and management level under the prevailing smallholder conditions in Malawi. In addition, when no labor costs were included, gross margin analysis showed that the Malawi Zebu was the most efficient genotype in a low-input low-output system. This therefore implies that the genotype of the dairy cow, management practice and labor costs (family and hired labor) have a significant influence on smallholder dairy returns.

Using gross margin and cost benefit analysis Meskel G.K and Gemechu A (2017) [9] makes a comparative study between crops and dairy farming and found that dairy cross breed milk production was economically more profitable than crop production of farm household level in the study area. They carried out the study in Ethiopia in which a total of 43 smallholder farmer were included in this study.

Chindime (2007) applied the gross margin analysis to examine returns from smallholder dairy among borrowers and non-borrowers of in kind credit in central and northern milk shed areas of Malawi. The results revealed that smallholder dairy farming was profitable for both borrowers and non-borrowers with borrowers reporting higher gross margins than non-borrowers.

In this study, in order to determine the profitability of dairy farms, gross margin and cost benefit analysis were used to estimate the average variable annual costs and returns of the farms and cost benefit ratio.

5. Results and Analysis

Gross margin calculation was based on the estimated production costs and revenue from milk and sale of cow. The analysis did not include the value of animals at the beginning and end of the year as this data was not available readily. Again only casual labour was considered in the study due to difficulties in measuring the exact family labour involved in dairying.

The results of gross margins for all the dairy farmers interviewed in the selected villages are presented in Table 1

Table 1: Gross margins per cow for sampled dairy farmers

Revenue	(In rupees)
Milk sales	109350
Milk consumed at home	12150
Sale of Cow	60000
Total Revenue	181500
Variable cost	
Concentrate feed	110000
Supplement feed	2160
Veterinary cost	4000
Labour cost	16200
Total variable cost	132360
Average gross margin	49140

Calculated by the researcher

The results indicate that the average gross margin per cow per year is Rs.49140 in the study area and the amount is approximately equal to average gross margin of Rs. 5460 per cow per month. The ratio of gross margin to the variable costs was 0.38. This value is low which implies that every rupee invested in variable cost of dairy enterprise by a farmer returns only 38 per cent.

In Morigaon the farmers had high milk yield due to better productive performance such as shorter calving interval and higher milk yields per lactation period. The price of milk received by the farmers was higher as compared to prices offered by other cooperative society in the state. The results revealed that milk production is generating income to the farmers in the study areas.

6. Conclusions and Suggestions

Conclusions

From Gross margin analysis the following conclusion can be made. The farmers in the study area are earning normal profit where the mean gross profit per cow per year is RS49140. The dairy farmers approximately earn 36 per cent for every rupee they invest in running cost of the dairy enterprise.

Dairy farming is profitable but the costs of concentrate feed; the costs of veterinary drugs, short lactation length, farmer non growing pastures, and importation of breeding stock at high cost are threatening the viability and profitability of the chain.

High feed cost, labour cost and health costs increased dairy production cost among the dairy farmers. On the other hand low milk price offered by the dairy cooperative society where the farmers sell their milk decreased milk revenue among the dairy farmers. Yet the average gross margins were positive among the dairy farmers implying that dairy production generates income for the dairy farmers in the study area.

From gross margin analysis the study reveals that the farmers are earning normal profit in the state. Thus it is said that dairy farming is viable in the study area. It is also known from the respondent that high feed cost, labour cost and health costs increased dairy production cost; if it persists dairy farming will be invisible in near future in the state.

Suggestions

The gross margin of the dairy farmers can be improved through reduction of feed cost and thereby increasing the volume of milk production. Moreover, component of veterinary services cost can also be reduced by taking preventive measures such as regular vaccination of cows which will reduce cost incurred by farmers in treating disease and therefore, gross margin can be improved. In addition government should protect these milk producers through either fixing milk prices or favorable tax policies.

Smallholder dairying in Assam is profitable and plays an important role in rural poverty reduction, creation of employment opportunities and in enhancing household nutrition and food security which is in line with the millennium development goals. Thus state Government need to allocate more resources towards smallholder dairy development particularly in the areas of animal breeding, marketing, infrastructure development and knowledge transfer.

Policy makers and stakeholders should also consider constructing more milk collection centers near the smallholder dairy farmers in order to reduce the distance travelled to deliver milk to the market. This will have a positive effect on milk production in Assam as more than half of the milk produced is from the smallholder dairy sector.

7. Limitation

The study is based on both primary and secondary data and hence the accuracy of the results depends on the accuracy with which the data were generated. The study has got its own limitation as the primary information was collected through interactions with the sample milk producers of the State. The milk producers do not have the habit of proper record keeping in black and white. Most of their information is memory based. Also, there is a possibility of wrong entry despite our utmost care. Further, non-availability of official data on time is also another limitation of the study.

References

1. Bayemi PH, Webb EC, Ndambi A, Ntam F and Chinda V. Impact of management interventions on smallholder dairy farms of the western highlands of Cameroon Tropical Animal Health Production. 2009; 41:907-912.
2. Chamdimba C. An analysis of technical efficiency of mixed intercropping and relay cropping Agro forestry technologies in Malawi: A case of Zomba District in Malawi. Unpublished Master's thesis, Bunda college of Agriculture, University of Malawi, 2007.
3. Dij AA, Huine RBM. Basic method in economic analysis in: Animal Health Economics, principles and Applications, postgraduate foundation in veterinary science. Australia, 1997, 25-40.
4. Ehui S. Livestock Policy Analysis: The Role of Livestock in Food Security, McGraw, New York, 2008.
5. Ergano K and Nurfeta A. Economic performance of case study dairy farm in Southern Ethiopia. Livestock Research for Rural Development, 2006, 18, 8 <http://www.lrrd.org/lrrd18/1/erga18008.htm> (accessed May 6,2010).
6. Johnson DT. A guide to farm Business Management in the tropics Macmillan Press. London, 1982.
7. Mburu LM, Gitu KW and Wakhungu JW. A cost-benefit analysis of smallholder dairy cattle enterprises in different agro-ecological zones in Kenya highlands Livestock research for rural development, 2007, 19(95). <http://www.lrrd.org/lrrd19/7/mbur19095.htm> (accessed September 17, 2010).
8. Mdoe N and Wiggins S. Returns to smallholder dairying in the Kilimanjaro region, Tanzania. Journal of Agricultural Economics. 1997; 17:75-87.
9. Meskel GK & Gemechu A. "comparative cost benefit analysis of dairy and cereal crops with special reference to Tef and Wheat crops: A case study of Adea and Lume district of east shoa Zone, Ethiopia" *American Eurasian J. Agric and Environ Sci.* 2017; 17(5):440-449,2017
10. Mwale SE, Wollny CBA, Banda JW, Chagunda MG and Bruns E. Evaluation of Malawi Zebu and its crosses on smallholder dairy farms in Mzuzu, northern Malawi Berlin Biodiversity and Development of Animal Genetic Resources National Statistical Office (2005). Poverty in Malawi from the Second Integrated Household Survey, An Extract of Findings. Malawi Government, Zomba. Malawi, 1999.
11. Mlay GI. The Economics of Smallholder Dairy Production in Hai District, Tanzania. IDRC Manuscript Report on Animal Feed Resources for Small-Scale Livestock Producers, 1989.
12. Mumba C. "Economic analysis of the viability of the smallholder dairy farming in Zambia". A dissertation submitted to B.V.M, University of Zambia, Lusaka, 2012.
13. Mwangi AC. Factors Determining the Economics of Milk Production on Smallholder Farms in Kenya. MSc. Thesis, Nairobi University, 1981.
14. Ndambi OA, Garcia O Balikowa D, Kiconco D, Hemme T, Latacz-Lohmann U. Milk production systems in Central Uganda: a farm economic analysis. Tropical Animal Health Production. 2008; 40:269-279.
15. Osotimehin KO, Tijani AA and Olukomogbon EO. An economic analysis of small scale dairy milk processing in Kogi State, Nigeria. Livestock Research for Rural Development, 2006, 18(11).

16. Patrick Kawambwa², Guido Hendriksen², Emelly Zandonda¹ and Libati Wangal. Business Viability assessment study of small holder dairy farming in Zambia. Wageningen, Alterra Wageningen UR (University & Research centre), 2014.
17. Somda J, Kamuanga M and Tollens E. Characteristics and economic viability of milk production in the smallholder farming systems in The Gambia. *Agricultural Systems*. 2005; 85:42-58.
18. Sturrock P. *Farm Accounting and Management* London. Pitman Press, 1971, 139-180.
19. Schmidt GH, Van Vleck LD and Hutjens MF. *Principles of dairy science*. Second edition, Prentice Hall Inc., 1988, 1-18.
20. ZWE P, Breyer FR and Kifman M. *Health Economics* Second Edition, Springer Dordrecht, Heidelberg, New York, London, 2009, 17-71.