

Review of: "Economics of Cattle Fattening - A Case of Bangladesh"

Sushree Sangeeta Dey¹

¹ Central Institute of Fisheries Education

Potential competing interests: No potential competing interests to declare.

The manuscript 'Economics of Cattle Fattening- A Case of Bangladesh' represents the real scenario of the production and marketing of beef cattle. A profound study has been done, and the analysis is well presented. The economics of cattle fattening has covered all aspects.

ABSTRACT

In Bangladesh, more than 90% of the people are Muslim. During Eid-UI-Azha (the Muslims' highest religious festival) aligned with the whole year, a huge number of cattle are slaughtered. Therefore, the demand for beef cattle is also very high. To trade off the increasing demand, fattening beef cattle is very popular. For this, research was conducted to investigate cattle fattening profitability and its marketing system. Study areas were selected from three districts, namely, Dhamrai under Dhaka; Kustia Sadar under Kustia, and Pachbibi under the Joypurhat district, considering the concentration of livestock farming and cattle fattening. The data were collected through a structured interview schedule from 90 farmers, 15 beparies, and 15 meat sellers by three different sets of questionnaires. Data were collected during the period from July 2018 to August 2018. Descriptive statistics and multiple regression analysis were applied to determine the factors that affect profitability. From the analysis, about 53% of farmers practiced cattle fattening the whole year, and 47% of farmers reared only before Eid-UI-Azha. The average benefit-cost ratio was estimated at 1.25, which implies that beef cattle fattening is a profitable enterprise. The coefficients of the variables treatment cost, feed cost, and labor cost were significant at a 1% level, indicating a positive association with profitability. The average net return of the bepari was BDT 1,964, and the average net return of meat sellers was found to be BDT 1,944. The most dominant marketing channels were identified as (i) Farmer-Bepari-Meat seller-consumer, and (ii) Farmer-Bepari-Consumer. The preferable channel, however, was Farmer-Consumer. Because farmers were able to maximize profit through this channel, even though marketing efficiency was found to be highest in this channel. The study recommends the provision of appropriate education and training and improving access to and availability of market information to reduce the challenges of establishing sustainable cattle fattening practices in Bangladesh.

Keywords: Cattle fattening, Profitability, Marketing system, and Marketing efficiency.

The abstract is well written, but it seems quite lengthy. It can be more specific. The underlined part can be shortened and rewritten.

INTRODUCTION

Livestock systems represent a potential pathway out of poverty for many smallholders in developing countries like Bangladesh. Most of the world's rural poor, and a significant proportion of the urban poor, keep livestock and use them in a variety of ways that extend far beyond income generation (Randolph et al., 2000; Bayer et al., 2004; and Ruhangawebare, 2010). In many cases, livestock is a central component of smallholder risk management strategies (Bailey et al., 1999). Livestock keeping in Bangladesh is basically a rural activity whereby more than 85% of households keep livestock (DLS, 2015). Statistics show that out of 3.33 million households in the country, 53% keep at least one type of livestock. It is estimated that the cattle population in Bangladesh is about 24.8 million, which ranks 12th in the world and 3rd in Asian countries (FAO, 2010), and the contribution of the livestock sector to the national GDP is 1.85% (DLS, 2023). Although the growth of livestock production is the second highest among all other subs of agriculture in Bangladesh (BER, 2012), production and consumption of livestock products are still much lower in comparison to other countries. At the household level, livestock plays vital economic and social roles in the lives of pastoralists and agro-pastoralists. In addition, beef cattle fulfill an important function in coping with shocks, accumulating wealth, and serving as a store of value in the absence of formal financial institutions and other missing markets (Negassa et al., 2011). Although there are many cattle all over the country, the contribution of livestock to pastoral livelihoods is substantially limited due to market constriction (MLFD, 2010). Mlote et al. (2012) argued that among the factors that prevent farmers from benefiting from the potential markets of their beef animals is the inadequate market information for their livestock. Other factors include inadequate marketing infrastructure (Mahabile et al., 2000; Williams et al., 2006; MLFD, 2006) and the prevalence of diseases like tick-borne diseases, and foot and mouth diseases (FMD) (Duvet and Stephanus, 2000). Livestock is not only the source of food and income but also the main three pathways of poverty: (1) securing the assets of the poor, (2) improving smallholder and pastoral productivity, and (3) increasing market participation by the poor. Large ruminants are cattle and buffalo, and small ruminants are sheep and goats, which constitute the major portion of livestock. Sometimes it is argued that the real contribution of the livestock sector is generally underestimated by more than a third because, in conventional GDP calculations, the values of draught power and animal dung (used as manure and fuel) are not included (Dickey and Huque 1986). It can be conversely argued that the values of paddy straw and other crop residues, which are the main animal feeds, are also not included in the crop sector GDP calculation. Ideally, these items should be included in the national input-output and social accounting matrices. So far, that has not been done, most probably because of a lack of accurate data. Available data on livestock have been considered both inadequate and poor in quality compared to crop statistics (Jabber and Green, 1983).

Fattening of animals is a highly profitable venture with a return of premium to the farmer. Bangladesh is a low-lying densely populated country with more than 160 million people, and about 75% live in rural areas. The rural poverty rate is 20.5%, whereas the overall poverty rate is 18.2%, of which 12.9% is extreme (HIES, 2022). Northern Bangladesh is currently working hard to develop its agribusiness through potential cattle fattening practices. Cattle fattening, mostly conducted through micro-credit activities, could form an appropriate tool for poverty alleviation and improvement in food security among the people (Maikasuwa et al., 2012). Cattle in Bangladesh are an inseparable and integral part of the agricultural farming and agribusiness system. Beef fattening is an emerging sector for employment and income generation for the rural poor, especially landless, destitute, and divorced women (Ahmed, 2010). One of the advantages of cattle

fattening by rural farmers is that they use locally available cattle feed resources during the Eid festival. In recent years, women farmers in Bangladesh have been involved in and sustained beef fattening programs in rural areas of the country. The cattle fattening practice was assessed considering general husbandry issues like major feed resources, watering, housing, and healthcare; the source of fattening cattle; selection criteria for the purchase of fattening cattle; the method and length of feeding; the season of fattening; and the live-weight change of the fattening cattle. The marketing system of fattening cattle was assessed by considering the purchasing and selling place, market participants, and the purchasing and selling price of fattening cattle in the study areas. In Bangladesh, a large number of studies have been conducted on growth trials with native male cattle based on different diets, which showed different growth responses in the animals. During the holy Eid-UI-Azha festival, Muslims always go for Kurbanī (sacrificing slaughtered livestock). Animals, including cows, goats, camels, and sheep, are slaughtered each year to mark the festival. Bangladeshi Muslims celebrate Eid-UI-Azha every year. About 1.8 million cattle are sacrificed within two or three days of this occasion each year (Sujan et al., 2011). So, the demand for cattle, especially beef cattle, increases several times during the holy Eid-UI-Azha festival. The price of cattle has also increased currently. Keeping this occasion in mind, many poor people are involved in bull fattening just before 3 or 4 months of Eid-UI-Azha, when they sell the animals at prices that result in a high margin. Understanding these points is important for cattle-fattening farmers and market analysts, as the information generated from the research provides insight into the design and improvement of strategies to alleviate the shortage of the supply of quality live animals (cattle) in the markets; therefore, the study is designed to assess the beef cattle fattening system, marketing, and marketing challenges and opportunities in the study areas.

Though Bangladesh has been involved in and sustained a beef fattening program in rural areas of the country, the information available in the literature on cattle fattening by small farmers in rural areas is few and sporadic (Hossain et al., 1996; Huq et al., 1997 and Hashem et al., 1999). To develop a sustainable beef cattle production system in Bangladesh that starts at the farmers' level for production and ends at the consumers' level for consumption, it is necessary to find out the existing beef cattle production, marketing, and processing systems. Many studies have shown that beef cattle fattening has greater potential for improving the living standards of people through improved nutrition arising from meat consumption and for generating incomes from the sale of cattle and beef cattle products. Despite the significance of the beef cattle sub-sector in the country, there are a number of constraints that livestock farmers are facing. Among the constraints that face livestock farmers are inadequate marketing information, especially on prices, poorly developed marketing infrastructure, weak institutional, legal, and regulatory frameworks, and inadequate access to financial services for livestock-rearing activities.

The overall objective of the study was to identify the profitability and marketing system of cattle fattening. The specific objectives of the study were as follows: (i) to assess the socioeconomic characteristics and factors influencing beef cattle profitability; (ii) to identify the marketing channels of fattened cattle and evaluate the marketing margin obtained by market actors along the channels; (iii) to determine the marketing efficiency in various fattened cattle marketing channels; and (iv) finally, to identify the problems faced by the cattle fattening participants and market intermediaries.

The rest of the article is organized as follows: sect. 2, the review of the literature from the contemporary world. Section 3 presents a detailed description of the study areas and the methodology. Section 4 presents the profitability of cattle

fattening and its marketing channels and marketing margin aligned with marketing efficiency. In section 5, the conclusions and recommendations of the study are presented.

The introduction part is nicely written.

REVIEW OF LITERATURE

The previous studies in the field of cattle fattening, marketing systems, and marketing margins, carried out at home and abroad, were reviewed in this chapter. No specific study on cattle fattening and marketing systems in the selected research areas has so far been conducted in Bangladesh. The studies that were found to be related were reviewed with attention. Nabi (1998) conducted a study on beef cattle marketing in Bangladesh. He showed that most of the time, meat sellers slaughtered aged draft animals or aged milk cows. Of the slaughtered animals, 47% were cows, 30% were bullocks, 10% were bulls, and 13% were heifer calves and bull calves. Hossain and Chandra (2002) conducted a study on the beef cattle marketing system in Bangladesh and investigated the marketing margin and marketing costs of beef cattle with the help of primary data collected randomly from 71 intermediaries from different market levels. Farmers, Bepari-1, Bepari-2, Dalals, and meat sellers involved in beef cattle marketing formed four different marketing channels in the study area. Around 15% of the total cattle sold in the study area were brought from abroad, and the rest were produced locally and purchased through Dalals. Alemayehu (2003) conducted a study on the marketing process in Ethiopia, which generally follows a three-step system with primary, intermediate, and terminal markets through which marketable animals and animal products are passed from producers to small traders and on to large traders and meat sellers. However, most producers sell their livestock and livestock products at local markets directly to consumers or small traders at relatively low prices.

Baset et al. (2003) studied beef cattle production in Bangladesh. They showed that a large number of farmers are involved in bull fattening just before 3 or 4 months of Eid-UI-Azha (Muslim festival) when they sell the animals at profitable prices. Farmers used three-year-old cattle for beef fattening. The cattle fattening period is 4.5 months in rural areas of Bangladesh. Lapar et al. (2003) conducted a study that in Vietnam most of the farmers do not have access to organized markets. Beef cattle marketing is composed of 4 middlemen: trader, wholesaler, slaughterer, and retailer. Abeyrante (2007) studied that in Sri Lanka, the marketing system has evolved through the active participation of private meat sellers and agents. It was reported that the farmer gets less than 40% of the retail price of meat and the rest of the profit goes to the middlemen. Elias et al. (2007) conducted a study and showed that the livestock marketing structure follows a four-tier system, in which different actors are involved in buying and selling beef cattle in the market system. The main actors of the 1st tier are local farmers and rural traders who transact at the farm level with a very minimal volume, 1-2 animals per transaction irrespective of the species involved. Some traders may specialize in either small or large animals. Those small traders from different corners bring their livestock to the local market (2nd tier). Traders purchase a few large animals or a fairly large number of small animals for selling to the secondary markets. In the secondary market (3rd tier), both smaller and larger traders operate, and traders and meat sellers from terminal markets come to buy animals. In the terminal market (4th tier), big traders and meat sellers transact a larger number of mainly slaughter-type animals. According to EntrePinoyAtbp (2008), cattle marketing in the Philippines is characterized by the existence of many middlemen in the

distribution network, which is to the disadvantage of producers who receive relatively low prices for their animals and consumers who pay a high price for meat products. Studies have shown that the gross margin derived from selling a head of cattle is 60-88%. They usually have bigger margins because cattle are bought from the farmers at a much lower price.

Ahmed et al. (2010) conducted a study on factors related to small-scale cattle fattening and investigated the systems of management in small-scale cattle fattening programs. The data were collected through an interview schedule from 215 respondents from 24 districts in 52 Upazilas who were involved in small-scale cattle fattening. Most of the respondents (79.1%) fattened cattle for 3-6 months, and the rest fattened for a prolonged period. About 90.2% of respondents used their own capital for cattle fattening. About 79.5% did not have any training in cattle fattening, whereas about 20.5% of respondents had taken short training in cattle fattening. About 63.7% of respondents used cattle fattening tablets, 27% of respondents used urea molasses straw (UMS), and 51% followed conventional feeding. Kadigi et al. (2013) studied the value chain of indigenous cattle and beef products in the Illemela and Magu districts. It was observed that there was weak vertical and horizontal coordination along the beef cattle value chain. Furthermore, the authors contended that the largest share of the gross margin was earned by meat sellers. A comprehensive policy for the livestock sector was launched only in 2005; its effective implementation and success remain to be seen. The government should encourage private investment in the livestock sector, but quality assurance of drugs, vaccines, feeds, and breeding materials through legal and regulatory frameworks is necessary for the sustainable development of the livestock sector. From the above discussion, it was revealed that many studies on cattle fattening and marketing systems were conducted in different parts of the world. However, only a few studies have been conducted in Bangladesh. In the country, this type of study is very important. So, the present study was undertaken to analyze the profitability of cattle fattening and the marketing channels of fattened cattle.

The review has been done well. It is, however, more important to appraise recent publications.

MATERIALS AND METHODS

Data

The study was conducted in three districts, namely Kushtia, Joypurhut, and Dhaka, based on cattle fattening density and marketing. From each district, one Upazila was selected purposively, and the selected Upazilas were Kushtia Sadar under the Kushtia district, Pachbibi under the Joypurhut district, and Dhamrai under the Dhaka district. For this study, both primary and secondary data were used. The primary sources were the cattle fattening farmer, bepari (middleman), and meat seller. For collecting primary data from the relevant respondents, interview schedules were prepared. Three separate sets of questionnaires were constructed for this purpose. One set of interview schedules was used for the cattle fattening farmers, the second one for beparis, and the third one for the meat seller. The questionnaires were developed in such a manner that all relevant data could be obtained. The interview schedules were pre-tested before finalizing them. The total sample size was 120, which consisted of 90 cattle fattening farmers, 15 beparis, and 15 meat sellers. Primary data were collected during the months of July to August 2018. Data were collected through direct interviews by making personal visits to the houses of farmers, meat sellers, and beparis. The objectives of the study were clearly explained to

the respondents before gathering information. The secondary sources were various publications from home and abroad. Some such secondary sources were BBS reports, reports of the Planning Commission of Bangladesh, DLS (Department of Livestock Services) reports, and kinds of literature concerning cattle fattening and marketing.

Analytical techniques

Profitability analysis

Costs and returns analyses were done on a total cost basis. The following equation was used to assess the profitability of the cattle-fattening farmers:

$$\Pi_i = \sum_{i=1}^n P_i Q_i - TC = \sum_{i=1}^n P_i Q_i - (VC + FC) \quad (i) \quad \Pi = \sum_{i=1}^n \Pi_i = \sum_{i=1}^n P_i Q_i - (\sum_{i=1}^n VC_i + \sum_{i=1}^n FC_i)$$

Where $\Pi_i = \Pi$ = Profit from the i^{th} cattle fattening farmer (BDT /cattle); Q_i = Quantity of the i^{th} cattle fattening farmer (No. /year); P_i = Average price of the i^{th} fattened cattle (BDT /cattle); TC = Total cost (BDT /cattle); FC = Fixed cost (BDT /cattle); $i = 1, 2, 3, \dots n$. The per-year profitability of cattle fattening from the viewpoint of individual farmers was measured in terms of gross return and gross margin.

Gross margin

For estimating the marketing margin earned by beparis and meat sellers, the following formulas were used:

$$GM_i = PR_i - PP_i \quad (ii) \quad GM = \sum_{i=1}^n GM_i = \sum_{i=1}^n PR_i - \sum_{i=1}^n PP_i$$

Where, M_i = Gross margin (BDT/cattle) for the i^{th} intermediary; PR_i = Price received (BDT/cattle) by the i^{th} intermediary; PP_i = Price paid (BDT/cattle) by the i^{th} intermediary.

Net margin

For estimating the net margin earned by the bepari and meat seller, the following formulas were used:

$$NM_i = GM_i - MC_i \quad (iii) \quad NM = \sum_{i=1}^n NM_i = \sum_{i=1}^n GM_i - \sum_{i=1}^n MC_i$$

Where, NM_i = Net margin (BDT/cattle) for the i^{th} intermediary; MC_i = Marketing cost incurred (BDT/cattle) by the i^{th} intermediary.

Determinants of the profit function

To determine the contributions of the most important variables in the cattle fattening process, the Cobb-Douglas production function was finally estimated. Judiciously, we had taken nine (9) variables to explain the production of cattle fattening. Before constructing the profit function, we checked multicollinearity among the explanatory variables. The general model was specified comprehensively in such a way that it could explain the production process of cattle fattening

adequately. To explore the input-output relationship of cattle fattening, the following linearized Cobb-Douglas production function model was used:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + U_i \quad (iv)$$

$$(iv) \ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + U_i$$

Where Y = Gross return from cattle fattening (BDT/cattle); X_1 = Age; X_2 = Education; X_3 = Family size; X_4 = Farm size; X_5 = Purchase price of cattle (BDTT); X_6 = Treatment cost (BDT); X_7 = Feed cost (BDT); X_8 = Labor cost (BDT); b_1 - b_8 = Coefficients of the relevant variables; \ln = Natural logarithm; U_i = Disturbance term, and a = Intercept.

Producer's share of the consumer's taka (Bangladeshi currency)

Farmers' share was calculated by the following formula:

$$\text{Farmer's share of the consumer's taka} = \frac{\text{Price received by the farmer}}{\text{Price paid by the retailers}} \times 100 \quad (v)$$

$$\text{Farmer's share of the consumer's taka} = \frac{\text{Price received by the farmer}}{\text{Price paid by the retailers}} \times 100$$

Return on investment (ROI)

For estimating the return on investment of the bepari and meat seller, the following formula was used:

$$\text{Return on investment (ROI)} = \left(\frac{\text{Net margin}}{\text{Total investment}} \right) \times 100 \quad (vi)$$

$$\text{Return on investment (ROI)} = \left(\frac{\text{Net margin}}{\text{Total investment}} \right) \times 100$$

Where, Total investment = Purchase price + Marketing cost

Marketing system

Network analysis, mainly a graphical technique, was performed for this identification. First, market actors were identified. Second, the volume of trade through each actor was measured. Third, a market chain was drawn.

Marketing efficiency

An ideal measure of marketing efficiency considers all of the following: a) Total marketing costs (TMC); b) Net marketing margins (NMM); c) Prices received by the farmer (FP); d) Prices paid by the consumer (CP). As there is an exact relationship among the four variables, i. e., $a + b + c = d$, any three of these could be used to arrive at a measure for comparing marketing efficiency. The following modified measure is suggested by Acharya (1999).

$$\text{MME} = \frac{\text{FPMC} + \text{MM}}{\text{FPMC} + \text{MM}} \quad (vii)$$

Where MME is the modified measure of marketing efficiency, FP is the price received by the farmer, and MC and MM are marketing costs and marketing margins, respectively.

‘Descriptive statistics and multiple regression analysis were applied to determine the factors that affect profitability’ - This sentence is written in the abstract, but its detailed description is not written in the methodology. I suggest using any statistical software like SPSS, SAS, R, etc., for the analysis of data.

RESULT

All data are well presented. However, the Result analysis part can be improved so that significant levels can be mentioned in all tables.

DISCUSSION

The discussion part should include a comparison of results with other studies.

CONCLUSION

The conclusion is well written.