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Optimizing Beef Fattening Management Strategies in Sadar Upazila, Kushtia: A Comprehensive Study

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ABSTRACT

Beef cattle are crucial for Bangladesh's economy, providing essential animal protein. However, beef cattle farmers in Kushtia Sadar Upazila, Kushtia District, face challenges like limited marketing channels, vaccination awareness, and disease outbreaks. A study interviewed 60 respondents, including 43.33% women and 24% young individuals, to examine the situation. Among the respondents, 36.67% raised cattle exclusively for Qurbani haat purposes, while 63.33% raised cattle for mixed purposes. Most farmers (73.33%) owned up to four cattle, with some managing larger herds. Indigenous cattle accounted for 36.63% of respondents, while crossbreed cattle made up 63.37%. The majority of farmers used typical feed ingredients for cattle's ration. Around 54% employed vitamin-mineral premix, while 46% did not. Disease prevalence indicated that nearly 70% of farms remained disease-free, but 20% encountered health issues like diarrhea and bloat. Lumpy skin disease affected almost 7% of farms, and foot and mouth disease affected 3%. When seeking medical support, 73.33% relied on village quacks, while 26.67% sought assistance from the Upazila veterinary hospital. Approximately 47% of respondents had connections with middlemen for marketing. The study revealed inadequate biosecurity practices on almost 40% of farms. To address the primitive management practices in beef cattle fattening and enhance production, the study highlighted the need for motivation and extension services. These measures can improve marketing, vaccination awareness, and disease prevention among beef cattle farmers in the region.

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Introduction

Livestock significantly contributes to Bangladesh's economy, with animal farming adding 86,798 million takas to the GDP at a growth rate of 9.66% (Das *et al.*, 2020). Beef cattle play a vital role in economic development, accounting for 36% of total animal protein, while the remaining 64% is sourced from poultry, fish, and pulses (Sarmaand Raha, 2015). Cattle fattening for beef production is a traditional livelihood activity and gains particular importance during Muslim festivals like Eid-ul-Adha. This emerging sector provides employment and income opportunities for rural poor, including landless, destitute, and divorced women, aiding in poverty alleviation (Mustafa, 2021). The current livestock population in Bangladesh comprises 2.45 million cattle, 1.5 million buffalo, 7.9 million sheep, and 26.6 million goats (Hossain *et al.*, 2022). Bull fattening serves as an effective tool for poverty alleviation and enhancing food security (Mustafa, 2021). Farmers in rural areas lack scientific methods for beef fattening, relying on traditional practices like offering chopped straw, mixing grass with straw, and using rice polish. Due to limited grazing land, cattle are raised intensively (Dung *et al.*, 2019). Commercial feed is provided, but proper quantity according to body weight is necessary (Mustafa, 2021).

Farmers in Bangladesh encounter challenges in selling their fattened cattle through various marketing channels, facilitated by intermediaries known as "Dalal" (Hasan *et al.*, 2011). Lack of vaccination awareness and disease outbreaks pose additional risks to beef-fattening farmers, affecting the health and weight of the cattle (Nicola *et al.*, 2021). Beef cattle fattening is a profitable venture for farmers in Bangladesh, who utilize rice straw and other feed substances for fattening (Kamal *et al.*, 2019). However, there is a shortage of feeds and fodder, hindering optimal livestock production (Baset *et al.*, 2002; Rahman *et al.*, 2012). A study was conducted to understand the feeding practices, health management, and marketing channels of beef cattle, as well as to identify and address problems faced by farmers in Kushtia Sadar Upazila, Kushtia.

Materials and methods

Research area and duration

The study was conducted at Kushtia Sadar Upazila, Kushtia for periods of 60 days starting from July, 2024 to August, 2024. The data was collected from various types of farmers involved with beef fattening in different areas of Kushtia Sadar Upazila, Kushtia.

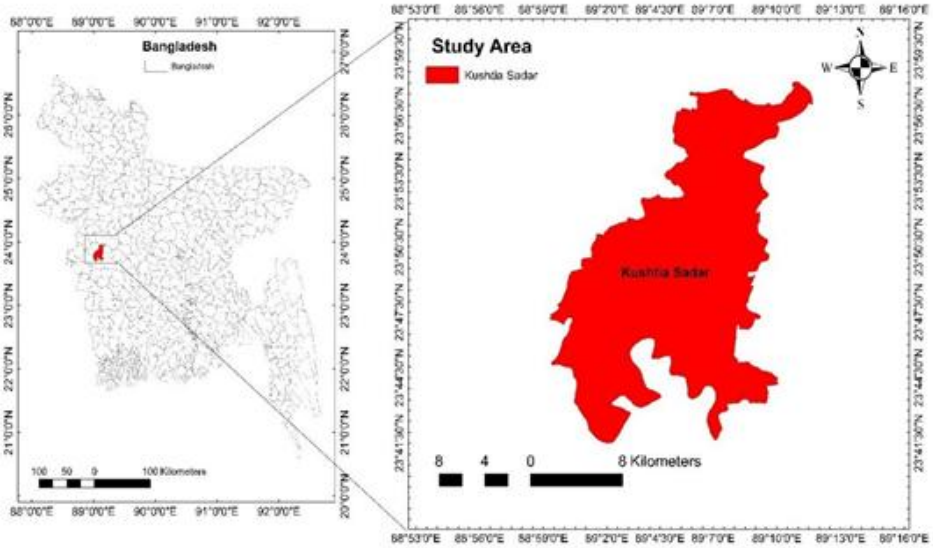

Figure 1. Study Area Bangladesh map (Left) and Kushtia Sadar Upazila (Right)

Preparation of Questionnaire and Interview Schedule

A questionnaire was designed and prepared for collecting data in detail keeping the views of objectives of the livelihood improvement of farmers through cattle fattening in selected areas of Kushtia Sadar Upazila, Kushtia. The respondents were selected who rear cattle or bought cattle for beef fattening. Respondents who are involved in cattle fattening purposes were selected randomly from Kushtia Sadar Upazila, Kushtia.

Data Collection

The survey was completed with a pre-structured questionnaire through face-to-face interview (Key Information Interview). Data was collected by face-to-face interview method with respondents. Interviews were normally conducted on the farms and respondents' houses during their leisure time.

Parameters Studied

Following qualitative and quantitative parameters, including general information were collected during the study period. The list of these parameters is Occupation, Education, Age of cattle owners, Socio-economic status of the farmers, Type of beef breeds, Animal source for beef fattening, Feeding Management system of the farm, Disease among the cattle, Marketing channels, Problems identification during rearing and marketing.

Data analysis

Data was compiled, tabulated, and analyzed with a simple statistical method to fulfill objectives of the study. The collected data were first transferred to Microsoft Excel spreadsheet and compiled to facilitate the needed tabulation. Analysis using SPSS software version 26.0 and descriptive statistics was used to quantify and summarize the data.

Results

Socio-economic status of the farmer

The survey data reveals that the majority of respondents (76.67%) were between the ages of 25 and 60, with the largest group falling within the 31-40 age range. Males constituted a slight majority (56.67%) compared to females (43.33%). Most individuals had over 10 years of experience (83.33%), primarily within the 10-20 years range. In terms of education, a significant portion (73.29%) had at least a primary education, with the highest percentage completing primary education (46.62%). The agricultural sector was the dominant occupation (53.28%), while own capital served as the main source of funding (90%). The purpose of fattening varied, with the majority (63.33%) engaging in it for both Qurbani haat and other purposes (Table 1).

Herd number (On the basis of the number of the animals)

The herd size of these farms is variable ranging 3 to 15 animals. The majority of farms have a few cattle for fattening. However, less than a tenth of the total participants have more than 15 cattle (Table 2).

Cattle breeds used for beef fattening

In the study area, the study showed that different types of breeds were reared for the fattening purpose. Among them, there were 36.63% indigenous and 63.37% were crossbred cattle. Most of the time, the farmers (79.9%) bought them for rearing. 20.1% of the total respondents chose the cattle from their herd for rearing purposes. The farmers who chose cattle from their own herd used both of the breeding methods. Almost 67% of them used Artificial insemination and the rest of them used natural breeding methods (Table 3).

Table 1. Demographic and Socioeconomic Analysis of Livestock Fattening Practices for Qurbani in a Rural Community

Variables	Categories	Frequency	Percentage (%)
Age (In year)	25-30	14	23.33
	31-40	22	36.67
	41-50	10	16.67
	51-60	12	20.00
	Above 60	02	3.33
Sex	Male	34	56.67
	Female	26	43.33
Experience (In year)	Less than 10	06	10.00
	10-20	32	53.33
	21-30	18	30.00
	Above 30	04	6.67
Level of Education	Illiterate	12	20.00
	Primary	28	46.62
	Secondary	04	6.67
	Above secondary	16	26.64
Occupation	Agriculture	32	53.28
	Business	06	10.00
	Service holder	02	3.33
	Others	20	33.33
Source of capital	Own capital	54	90.00
	Loan from bank/ NGOs	04	6.67
	Others	02	3.33
Purpose of fattening	For Qurbani haat only	22	36.67
	For Qurbani haat + other purpose	38	63.33

Table 2. Herd Size Distribution and Management Practices in Livestock Farms

Herd Size of Farms		
Parameter	**Frequency**	**Percentage (%)**
≤4 animals	44	73.33
5-8 animals	10	16.67
9-15 animals	02	3.33
>15 animals	04	6.67

Table 3. Characteristics and Practices of Cattle Types, Sources, and Breeding Methods in a Study Population

Parameter	Categories	Respondents (%)
Cattle type	Indigenous	36.63
	Crossbred	63.37
Source	Own Source	20.1
	Purchase	79.9
Breeding Method	Natural	33.33
	AI	66.67

Table 3 presents information on the characteristics and practices of cattle types, sources, and breeding methods in a study population. The respondents reported that 36.63% of the cattle were indigenous, while 63.37% were crossbred. In terms of sources, 20.1% of the cattle were from the respondents' own sources, while 79.9% were purchased. Regarding breeding methods, 33.33% of the respondents used natural breeding, while 66.67% used artificial insemination (AI).

Feeding Management

Feed stuffs and feed Supply

The study showed that the participants of the survey generally use the typical concentrate mixtures which are very common across the country. The ingredients which are common among the farmers are rice, wheat bran, oil cake, chick pea, oil cake etc. Green fodder along with concentrate can enhance the growth performance (Mustafa, 2021). In the case of roughage, there are different practices among the farmers. 56.67% of the total participants use green grass with rice straw together and the other 43.33% think that green grass is not necessary to be supplied with rice straw (Table 4). In the case of concentrated feed supply, readymade feed from the market was not popular among the respondents where 90% of them did not use the market feed at all. Instead of this, respondents used concentrated mixture made by them. 76.7% used the homemade mixture regularly and the rest of them used it on an occasional purpose (Table 4). The results of the present study were almost in line with the findings of a researcher (Alam, 2022), who observed that except 5% of their respondents, the rest 95% were familiar with the homemade concentrate feeding.

Usage of synthetic vitamin mineral premix is seen among the farmers. From the Table 4, it can be found that 26.67% farmers are regular users of it, another 26.67% use it irregularly and 46.67% of them do not use vitamin-mineral premix at all.

Biosecurity scale

The questionnaire prepared to conduct the survey had 6 questions regarding biosecurity maintained on the farm. Each question had a particular score of 1.67 and the total number was 10 and thus the scale was set to 10. Biosecurity is important as it can reduce the threat of various diseases but the farmers do not follow it (Islam *et al.*, 2016). Table 6 showed that 40% of the total number of farms has a very poor biosecurity and 6.67% of the total farms maintain very good biosecurity. Among the rest, 10% maintain good biosecurity and the other 13.33% have moderate biosecurity on their farm (Table 6). Many farms were located at the open place and did not have proper fencing. For reasons like that, biosecurity is hampered in those farms.

Table 4. Diet Composition and Usage of Feed Supplements among Livestock Owners in a Study Population

Parameters			Frequency	Percentage (%)
Roughage	Only Straw		26	43.33
	Straw with green grass		34	56.67
Concentrate	Readymade feed	Regular	00	00
		Irregular	06	10
		Not at All	54	90
	Homemade mixture	Regular	46	76.7
		Irregular	14	23.3
		Not at all	00	00
Vitamin-Mineral Premix	Regular User		16	26.67
	Irregular User		16	26.67
	Not at all		28	46.67

Health management

Table 5. Health Issues, Medical Support, and Preventive Measures in Livestock Management: A Six-Month Analysis

Parameters		Frequency	Percentage
Health problems in last 6 months	Bloat	04	6.67
	Diarrhea	08	13.33
	FMD	02	3.33
	LSD	04	6.67
	Not at all	42	70
Medical support	Only from quack	44	73.33
	From both UVH & quack	16	26.67
Vaccination and deworming scenario	Vaccinated	08	13.33
	Non-vaccinated	52	86.67
	Proper Deworming	28	46.67
	No Deworming at all	32	53.33

Table 6. Assessment of Livestock Performance and Management: Rating and Distribution Across Different Ranges

Range	Remarks	Frequency	Percentage (%)
Above 8	Very good	04	6.67
7-7.9	good	06	10
6-6.9	OK	08	13.33
4-5.9	Not good	18	30
≤3.5	Poor	24	40

Marketing management

Marketing channels popular among the farmers

The following Venn diagram showed the relationship between different marketing channels used by the participants. The most common marketing place is the local market which is popular to all of them (100%). Some of them takes their animal to the other district especially during “Qurbani Eid.” Some of them also supplied animals to local slaughterhouses according to demand (Figure 2).

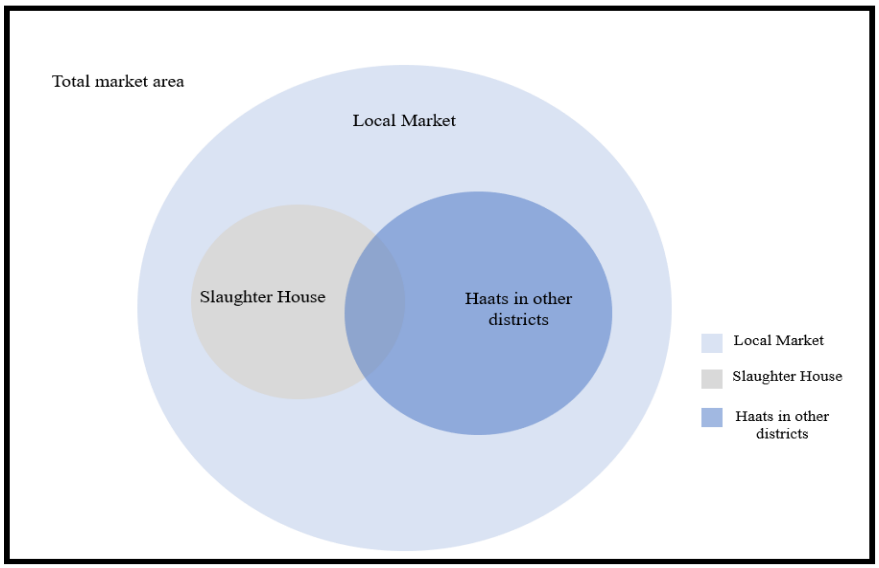

Figure 2. Venn diagram on popular marketing channel among the farmers

Middleman effect

Middlemen are locally called- “Dalal” who help the producers to sell their animals to the customers for some commissions. Their connection in local markets and Qurbani haats are very strong. Sometimes farmers do not want the hassle of selling animals directly to the customers and that is why they depend on the middlemen. On the other hand, farmers do not trust the middlemen most of the time because of their garrulity and their demand. The study showed that 53.33% of the total participants directly handle the marketing procedure by themselves. Among the rest of them, 20% had contacts with middlemen once or twice and the rest 26.67% had regular contact with middlemen (Table 7).

Table 7. Engagement with Middlemen in Livestock Transactions: Contact Frequency and Practices

Criteria	Frequency	Percentage (%)
No contact with middleman	32	53.33
Regular contact with middleman	16	26.67
Rarely contact with middleman	12	20.00

Attitude Towards Beef Fattening

In the prepared questionnaire, there were some specific questions to understand the attitude of farmers towards beef fattening programs. All participants participated in this section and the result is shown on the following table:

Table 8. Attitudes Towards Beef Fattening: Perceptions of Difficulty, Profitability, Socio-economic Impact, and Comparison with Crop Production

Statement prepared by questioner	Attitude							
	Yes		No		Not so sure		Skipping the questions	
	Number	%	Number	%	Number	%	Number	%
Beef Fattening is difficult work.	06	10	34	56.67	12	20	08	13.33
Beef Fattening is a Profitable business.	34	56.67	00	0	16	26.67	10	16.67
It is changing Socio-economic condition of the village.	10	16.67	14	23.33	28	46.67	08	13.33
It is Profitable than crop production	52	86.67	00	0	08	13.33	00	0

General problems faced by the farmers

The prepared questionnaires had a specific table containing some problems faced by farmers involved in bee fattening. Each participant gave answer for the section and the result with percentage is given below:

Table 9. Challenges and Issues Faced by Livestock Owners: A Study on Price Hikes, Medical Support, Feed Availability, Disease Susceptibility, Marketing Facilities, and Training

Possible problems	Frequency of respondents who faced the problems	Percentage (%)
Price-hike	60	100
Lack of medical support	54	90
Non-availability of plenty feeds and fodders	18	30
Susceptibility of diseases	18	30
Lack of marketing facilities	12	20
Lack of training	08	13.33

The survey respondents reported various problems in livestock management. The most prevalent issue was the price hike, affecting all respondents (100%). Additionally, 90% of the participants faced a lack of medical support for their livestock. Around 30% experienced challenges related to the non-availability of an adequate supply of feeds and fodders. Susceptibility to diseases was another concern, affecting 30% of the respondents. Lack of marketing facilities was reported by 20% of the participants, and a shortage of training opportunities was highlighted by 13.33% of the respondents (Table 9). These findings emphasize the need for interventions and support in addressing these problems to improve the overall management of livestock.

Table 10. Suggestions for Improving Livestock Management and Market Conditions: Insights on Veterinary Services, Subsidies on Feed Ingredients, Quality Breeding Resources, and Government Market Monitoring

Suggestions	Frequency gave the opinion	%
Adequate veterinary services	48	80
Subsidy on the feed ingredients available in market	52	86.67
Good quality breeding bull/seed in case of natural breeding	24	40
Market monitoring by government during peak time	42	70

Respondents expressed the need for better veterinary services (80%), subsidies on feed ingredients (86.67%), access to quality breeding resources (40%), and government market monitoring (70%) to address livestock management challenges (Table 10).

Discussion

The data was collected based on 60 respondents at Kushtia Sadar Upazila in which 3.33% were above 60 years, 16.67% were between 41-50 years, 20% were between 51-60 years, 23.33% owners were between 25-30 years, and 36.67% were between 31-40 years which is the highest percentage which indicates the more participation of middle-aged people in beef fattening program. Among them, 43.33% were women which was higher than the findings of some reports where female participants were only 15% and 18% respectively (Sarma *et al.*, 2014; Kabir *et al.*, 2020). This indicates the improvement of women empowerment in rural areas which is a positive approach. According to the study, among the 60 participants 10% of them had less than 10 years of experience in case of beef fattening. On the other hand, 53.33% had 10-20 years of experience

which was the most populated group, 30% had 21-30 years of experience and 6.67% people possessed more than 30 years. Most of the participants of the study had some knowledge of education. Almost 7% were deprived of the light of education where the other 93.33% had different levels of education which supports the others scholar reports (Rahman *et al.*, 2012; Sarma *et al.*, 2014). Agriculture was the most common occupation among the respondents. 53.28% of them were involved with agriculture by profession (Rahman *et al.*, 2012). 33.33% of the respondents held the category of "Other" which was mostly filled-up by housewife women. In case of other findings, Researchers may have the higher percentage but they also match agriculture as the most popular occupation (Kabir *et al.*, 2020). Respondents from the selected area seemed to be more stable in case of their capital than the findings of others where 56% depended on their own capital and in this study 90% of the farmers totally depended on their own capital (Rahman *et al.*, 2012). From the findings of (Kabir *et al.*, 2020) it is seen that 82% of their total respondents depended on their own capital where the result showed 50% independent respondents in case of capital (Rahman *et al.*, 2012). The selected areas were always familiar with the beef fattening program and this could be the possible reason behind the self-dependent investment as almost all the respondents are familiar with this program for many years. Most farmers with beef fattening typically run their practices for extra income or family support. That is why they usually lack much capital and keep their herd small.

The study also proved the statement. Most of the study participants, around 73.33%, have less or equal to 4 cattle. Among the remaining participants, 16.67% have 5-8 cattle, 3.33% have 9-15 cattle, and 6.67% have more than 15 cattle on their farm (Table 2). This result was slightly deviated from the findings of (Sarma *et al.*, 2014) where 33.3% of the farm got 2-4 animals, 46.7% got 5-6 animals and 20% got 7-8 animals. The area which was selected had a long tradition for rearing beef cattle which may influence the respondents to keep and rear more cattle for fattening (Sarma *et al.*, 2014). Chander et al, (2016) found that natural insemination was adopted by 33.33% and artificial insemination was adopted by 66.67%. It is also revealed that, indigenous breeds were adapted to local conditions and resistance to disease but in the study area 88% use crossbred cattle for beef cattle production (Chander *et al.*, 2011).

Regular vaccination was not so popular in the study areas like the result gained by researchers (Islam *et al.*, 2016). Among the respondents from the study area, 20% vaccinated their cattle where the findings of an article revealed that only 13.33% respondents vaccinated their cattle against FMD, Anthrax, Black quarter disease and hemorrhagic septicemia (Islam *et al.*, 2016). But in case of deworming the result was different. Where, scientists found that 22.4% respondents performed deworming on their cattle. But in the case of the study area, the number was almost double (Islam *et al.*, 2016). Almost 46.67% of respondents followed a deworming schedule. The respondents of the study area who followed a deworming schedule shared almost similar thoughts about deworming: that it might be helpful to gain more weight compared to non-dewormed cattle (Table 5).

Disease outbreak hampers the production of the farm. The study was conducted to find out the diseases or abnormal health conditions seen in the selected farms in the last six months. The study showed that 70% of the farms were totally free from any kind of disease. Among the rest, diarrhea was seen in 13.33% of the farm, bloat was seen in 6.67%. But there was also an outbreak of LSD in 6.67% farms and FMD was seen in 3.33% farms (Table 5). Reasons behind spreading contagious diseases and other conditions were almost similar and biosecurity was one of them. Also lack of knowledge, improper feeding management etc. were also some reasons. It was also found 11.87% of their respondents suffering from disease attacks on their farm (Sarma *et al.*, 2014). The study showed that 73.33% of the participants get their medical support from the quack doctor of the respective area and they do not go to Upazila Veterinary Hospital (UVH) for treatment. The rest 26.67% may have good contact with UVH but they also depend on the quacks in case of emergency (Table 5). The vast area covered by only one UVH, transportation difficulties, and unawareness of the owner was the reasons behind the rise of the quacks. This statement was supported by (Kabir *et al.*, 2020) where 95% respondents chose quack in case they needed medical support.

Conclusion

To conclude, the majority of participants were middle-aged farmers, engaged in agriculture as their primary occupation, highlighting their socio-economic status. Female participation showed improvement, indicating progress in women empowerment. Farmers generally had some education and invested using personal capital. The majority owned small herds, suggesting beef fattening for supplementary income or family support rather than large-scale ventures. Crossbreeds were the preferred cattle for fattening, acquired through purchases. Feeding management involved homemade concentrate mixtures, combining rice straw and green grass. Vaccination rates were low, while deworming had better compliance. Prevalence of diseases like diarrhea, bloat, LSD, and FMD was relatively low. Biosecurity measures were generally inadequate, lacking proper fencing and compromising security. Moreover, the results showed that most of the farmers did not follow scientific feeding, breeding, and health care management practices rather than following traditional backyard rearing systems. The progress of beef fattening practices seems unsatisfactory due to faulty management practices and unawareness about importance of management practices. Local markets were the favored sales channel, often facilitated by middlemen. Attitudes towards beef fattening were unspecified. Overall, the findings indicate a preference for small-scale operations, limited adoption of advanced practices, and reliance on traditional methods. Further research and interventions are necessary to enhance biosecurity, vaccination practices, and access to veterinary services.

Competing interest

The authors declare that they have no competing interests.

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