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A review on present condition, problems and prospect of beef cattle production: Bangladesh perspective

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ABSTRACT

The economic development of Bangladesh has provided an opportunity for beef production to meet its increasing demand. With the rise in income level and change in dietary habits of Bangladeshi people, beef fattening is expected to become more popular in the coming years. Cattle fattening has not yet been established as an industry in the country, but due to market prospects of beef, beef cattle fattening may be an important sector both in terms of income generation, employment, and food security. Little information is available on beef cattle production in Bangladesh. This review is going to focus on the existing beef cattle production system, its challenges, and prospects in the Bangladesh context.

Introduction

The demand for beef as a protein source is increasing worldwide, although in most countries beef accounts for considerably less than half of total meat consumption. Beef provides a highly desirable eating experience and its demand is increasing in developing countries. World beef production has increased by 151.6% from 1960 to 2022. This reflects the demand for beef worldwide as populations continue to grow and people's dietary habits and preferences shift towards meat-based diets. In Asia, more so than in many parts of the world, beef consumption dynamics are undergoing rapid changes due to the rapid pace of economic development in Asia and its surrounding countries. The increasing demand in developing countries for animal-based food sources, including red meat, is predicted to double by 2050 (Smith *et al.,* 2018). The growing food needs of an expanding human population and the challenges of global climate change have resulted in many livestock scientists in Asia focusing on the development of sustainable ruminant production systems (Smith *et al.,* 2018). Bangladesh is a developing country and one of the world's fastest-growing economies over the past decade. The Bangladesh economy

has been showing sustainable recovery from the impact of the global coronavirus pandemic. Bangladesh's Gross Domestic Product (GDP) for 2023-24 was 5.82%, slightly higher than the 5.78% growth in 2022-23. The population growth rate of Bangladesh increases 1.03% in 2023 from 2022 (BBS, 2023). The increasing growth rate of population and GDP, along with the improvement in living standards, increases the demand for nutritious food. Beef is a good source of protein. In 2018, Bangladesh produced 706 thousand tons of meat where the amount of beef was 199 thousand tones (28.28%) (FAO, 2020). Due to urbanization, increasing income, as well as a change in food habits, beef cattle products demand in Bangladesh is growing rapidly (Sarma *et al.,* 2017). There is always a high demand for fattened beef cattle during the Muslim festivals, especially in Eid-ul-Azha. That's why in Bangladesh cattle fattening for beef production has become an important and popular business as dairy industry. Nowadays, beef cattle are valuable as a source of income, animal protein, fertilizer, employment opportunities, women empowerment, and agricultural waste utilization and as savings for farmers.
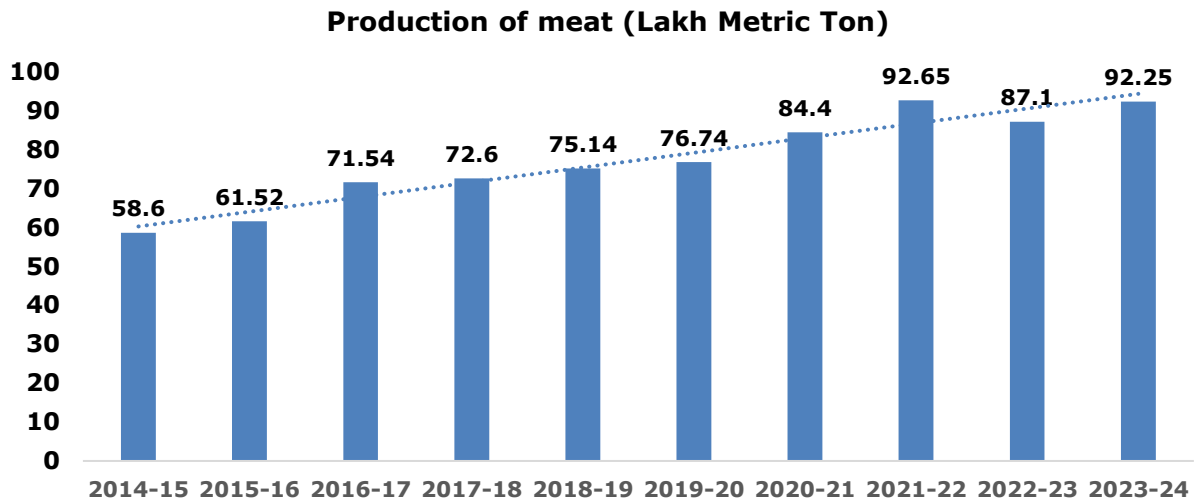
Production of meat (Lakh Metric Ton)

Fig 1: Meat production trend in Bangladesh in last 10 years (Source: DLS, 2024).

Cattle fattening is profitable in Bangladesh (Hasan *et al.,* 2011). Bull fattening is a common practice among farmers, typically occurring just before Eid-ul-Azha (a Muslim festival), when they sell the animals (Amin *et al.,* 2016). As there are no beef-type cattle in the country, farmers typically fatten local or cross-bred dairy bulls to increase beef production in Bangladesh. The poor genetic potential of Bangladeshi non-descript-type cattle has prompted policymakers to consider crossbreeding as a means to improve production in diverse environmental conditions (Mahbubul *et al.,* 2020). Beef production is one of the fastest-growing sectors in Bangladesh, and its commercialization is increasing these days, which in turn increases farmers' interest in this sector. Commercial beef cattle fattening has a vast future for industrialization. So, an attempt was made to overview the present situation, limitations, and prospects of beef fattening in Bangladesh.

Methodology

Data were collected from published manuscripts and well-known scientific websites up to November 2023. Different journal articles, book chapters, theses, websites, and other governmental and non-governmental reports were thoroughly reviewed to extract information related to the research objectives. Duplicate articles from different databases were excluded.

Results and Discussions

Capital

Capital is one of the most essential factors for beef production in Bangladesh. Research published a decade ago reported that 50% (Rahman *et al.,* 2012) to 84% (Hashem *et al.,* 1999) of farmers mentioned that a lack of credit was the major problem for cattle fattening. However, recent results reported (Islam *et al.,* 2022; Ahmed *et al.,* 2021) that only 10-15% of

farmers in the northern and north-western parts of Bangladesh mentioned inadequate credit as a barrier to improving their business. These farmers invest their own money, suggesting that credit is no longer a major issue for most farmers in establishing a beef cattle fattening business, particularly in the north and northwest parts of the country.

Table 1: Trends in source of capital for beef cattle fattening.

Source of capital	Percentage	Study area	Reference
Own fund	90	Rajshahi	Islam *et al.* (2022)
	50	Dhaka	
	40	Khulna	
	50	Barishal	
	40	Chottogram	
	50	Sylhet	
	55	Rangpur	
	86.7	Panchagarh	Begum *et al.* (2007)
	90.2	24 districts	Ahmed *et al.* (2010)
	70	Mymensingh	Rashid *et al.* (2016)
	51.3	Gazipur, Mymensingh, Sirajgonj, Rajshahi	Kamal *et al.* (2019)
	78.7	Mymensingh, Comilla, Pabna	Islam *et al.* (2012)
	56	Dinajpur	Rahman *et al.* (2012)
	83	Mymensingh	Karim *et al.* (2020)
	56	Rangpur	Hasan *et al.* (2021)
	84		Hashem *et al.* (1999)
Bank loan	2	Mymensingh, comilla, Pabna	Islam *et al.* (2012)
	2.3	24 districts	Ahmed *et al.* (2010)
	4.4	Rangpur	Hasan *et al.* (2021)
	5	Mymensingh	Rashid *et al.* (2016)
	23.8	Gazipur, Mymensingh, Sirajgonj, Rajshahi	Kamal *et al.* (2019)
	24	Dinajpur	Rahman *et al.* (2012)
NGO loan	4.2	24 districts	Ahmed *et al.* (2010)
	11	Mymensingh, Comilla, Pabna	Islam *et al.* (2012)
	17	Mymensingh	Rashid *et al.* (2016)
	20	Gazipur, Mymensingh, Sirajgonj, Rajshahi	Kamal *et al.* (2019)
	20	Dinajpur	Rahman *et al.* (2012)
Mohajon/lend money	3.3	24 districts	Ahmed *et al.* (2010)
	4	Mymensingh, Comilla, Pabna	Islam *et al.* (2012)
	5	Gazipur, Mymensingh, Sirajgonj, Rajshahi	Kamal *et al.* (2019)
	6.7	Rangpur	Hasan *et al.* (2021)
	8	Mymensingh	Rashid *et al.* (2016)

The above table indicates that there is limited data available on the capital sources of beef cattle production in the southern, northeastern, and southeastern regions of Bangladesh. Published research data indicate that a maximum beef cattle production study was conducted in the northern part, with some sporadic work also occurring in central areas of Bangladesh.

Breed

Despite being a promising sector, the beef cattle sector in Bangladesh remains underdeveloped

due to a lack of initiation and proper guidance to upgrade local cattle for increased beef production (Saha *et al*., 2019). Indigenous cattle are the primary source of beef cattle production in Bangladesh. Rahman *et al*. (2013) reported that more than 90% of cattle genotypes in Bangladesh are indigenous zebu cattle and only 2-3% are crossbred cattle. Again, Saha et al. (2019) reported that according to data from DLS in 2018, the majority (85–90%) of cattle were indigenous type, where the percentage of upgraded crossbreeds like Sindhi, Sahiwal, Jersey, and Holstein-Friesian crosses was only 10-15%. Previously, Faruque *et al.* (2001) reported no mention of improved beef cattle in Bangladesh. However, Islam *et al*. (2012) found that, for fattening purposes, the vast majority of farmers (92%) chose beef-type cattle. Compared to cross-bred cattle, the low cost of feed and high disease resistance are the primary reasons farmers prefer indigenous cattle. Whereas a survey conducted in the Jhenaidah district reported that nearly half of the farmers (48.3%) used crossbred, 45.0% used indigenous breeds, and the remaining 6.7% used both crossbred and indigenous breeds (Mamun *et al.,* 2019). The uncastrated male was selected by the majority of farmers (86.3%) reported by Kamal *et al.* (2019) and 80.7% reported by Islam *et al.* (2012) for the fattening program. The same preference was noticed in the Rangpur district, where 88.89% of farmers reared uncastrated bulls, and none of them reared cows or heifers for fattening purposes (Hasan *et al.,* 2022). In consequence, Hashem *et al*. (1999) reported that 5.2% of farmers reared female cattle for beef fattening purposes.

In the case of breed selection, a majority of farmers in the Rangpur district preferred indigenous bulls (44.44%), followed by crossbred (24.44%), and the rest (31.11%) were willing to rear both (Hasan *et al.,* 2022). Similarly, 61.16% of respondents in the Mymensingh district preferred indigenous breeds, while 38.84% of farmers preferred crossbred animals (Rahman *et al.,* 2013). The primary reason for the preference for the indigenous genotype is its comparatively easier management and lower feed requirements (Siddiquee *et al.,* 2013). At Mymensingh, Siddiquee *et al.* (2013) found that 43.07% of farmers used the Holstein-Friesian cross, while the proportions for Sahiwal and Red Chittagong were 14.60% and 39.41%, respectively. Considering the agro-climatic condition, the Brahman breed is more suitable for beef production in Tropical and sub-tropical regions (Antonio *et al.,* 2004). According to the socio-economic condition, upgraded Brahman Cattle may be more adaptable for improving indigenous cattle in terms of beef production (Haque *et al.,* 2016). After a trial using 25% and 50% Brahman-crossed calves, Haque *et al.* (2016) suggested that 50% Brahman-cross cattle are better for Bangladesh. Rabeya *et al.* (2009) also stated that being tropically adapted as a Bos indicus type, the Red Chittagong Cattle (RCC) is best suited for the low-input production system primarily practiced in Bangladesh. Though RCC has very high genetic potentiality but due to some difficulties like unplanned cross-breeding, lack of proper feeding, poor husbandry practices and health management, it is almost near to being extinct (Bhuiyan *et al.,* 2005). A study by Rabeya *et al.* (2009) found that, from a breeding perspective, RCC may exhibit a rapid response in selection and breeding programs to improve body weight and develop indigenous beef breeds. A study conducted by Sultana *et al.* (2017) on native Pabna bulls at the cattle research station of the Bangladesh Livestock Research Institute (BLRI), Savar, Dhaka, recommended that Pabna bulls aged 24 to 36 months may earn more profit than younger Pabna bulls.

Housing

Housing is essential for maintaining good health and optimal productivity. However, due to ignorance and insolvency, farmers typically focus less on cow housing (Saha *et al*., 2019). The housing of beef cattle varies according to the producer's personal preferences, country, area, climate, stage of production (Park *et al.,* 2020), and the economic condition of the farmers. There are three types of housing systems practiced for cattle fattening in Bangladesh. Are-Intensive*:* These are systems where cattle are in confinement and are entirely dependent on humans to provide for basic animal needs such as food, shelter and water daily; *Semi-intensive:* These are systems where cattle are exposed to any combination of both intensive and extensive husbandry methods, either simultaneously, or varied according to changes in climatic conditions or physiological state of the cattle; *Extensive*: These are systems where cattle have the freedom to roam outdoors, and where the cattle have some autonomy over diet selection (through grazing), water consumption and access to shelter. In the Rangpur district, 44.44% of farmers reared beef cattle intensively and 55.56% practiced semi-intensive systems where no farmers practiced extensive systems in rearing beef cattle (Hasan *et al.,* 2022). Hossain *et al.* (1996) observed that most of the farmers provided separate houses for fattening cattle.

About 31.6% of respondents offered existing traditional cattle sheds (Ahmed *et al.,* 2010). Around 36.7% of farmers provided permanent housing, 36.7% of farmers semi-permanent, 23.3% of farmers provided in shade & bamboo structures and 3.3% of farmers provided earthen wall houses (Mamun *et al.,* 2019). After a survey in 14 upazilas covering 9 districts, Amin *et al.* (2020) observed that most of the cattle houses were shabby (47.89%), followed by full tin (31.01%), katcha (14.94%) and semi pakka (6.17%). Only 36% of farmer-maintained biosecurity measures on their farm which is not satisfactory (Kamal *et al.,* 2019).

Feeding

The availability of feed and feeding practices are related to agroecology, location, season, the level of the fattening enterprise, land availability, the type of farming system, etc. In Bangladesh, beef cattle are reared under both semi-intensive and intensive feeding systems. However, most beef fatteners employ semi-intensive feeding systems (Islam *et al.,* 2022). It was found that rice straw was the main feed source and 96.3% of farmers gave both roughage and concentrate and 3.8% of farmers gave only concentrate (Kamal *et al.,* 2019). Another study shows that the majority (58.3%) of farmers provided cultivated fodder and compound feed. In comparison, 5% of the farmers fed roadside grass and cultivated fodder, 10% of the farmers fed cultivated fodder & mixed feed, 1.7% of the farmers fed compound feed & mixed feed, 23.3% of the farmers fed roadside grass, cultivated fodder & compound feed and rest 1.7% farmers used roadside grass, cultivated fodder & mixed feed to beef cattle (Mamun *et al.,* 2019). Hossain *et al.* (2016) reported that most farmers (83%) used cultivated fodder, while 17% used both cultivated fodder and roadside grass during the rainy season. During the rainy season (March to August), rice straw, green grass, mustard oil cake, wheat bran, rice polish and molasses, while on the other hand during the dry season (September to February), rice straw, green grass, mustard oil cake, wheat bran, rice polish, molasses, water hyacinth, tree leaves, weeds and kitchen waste were used by the respondents in the semi-intensive system (Ahmed *et al.,* 2010). Based on availability, molasses, boiled rice, wheat bran, oil cakes, and other unconventional feeds such as water hyacinth, banana leaves and stems, tree leaves, and sugarcane tops, as well as vegetable by-products, are also supplemented with a straw-based diet (Baset *et al.,* 2003). In Dinajpur district, around 34.7% of farmers provided beef fattening tablets,

28.0% of beef fattener used Urea Molasses Straw (UMS), and 26.7% of farmers supplemented Urea Molasses Block (UMB) in beef fattening (Rahman *et al.,* 2012)). In the case of feed supplementation, about 65% of farmers used vitamins and minerals (Mamun *et al.,* 2019) and 95.3% of farmers used feed additives (Islam *et al.*, 2012), 58.8% of farmers used steroids as a growth promoter (Kamal *et al.,* 2019) in contrast only 5% farmers are found in the Rangpur district who used steroid as a growth promoter in beef cattle fattening (Hasan *et al.,* 2022).

Vaccination

A regular vaccination program is essential for the successful fattening of beef cattle. Although only 26.7% of farmers practiced vaccination against anthrax, foot-and-mouth disease (FMD), brucellosis, black quarter, and other diseases, 73.3% of farmers didn't (Mamun *et al.,* 2019). During cattle fattening, 83.3% of farmers used vaccination (Begum *et al.,* 2007), and 72.6% of respondents regularly used vaccines against infectious diseases (Ahmed *et al.,* 2010). However, Mamun and Billah (2018) reported that only 26.7% of farmers in the Jhenaidah district apply for vaccines against infectious diseases. Most farmers (81.7%) practiced deworming (using Albendazole, Fenbendazole, benzimidazoles, and imidazothiazoles, among others) in their fattening program at regular intervals. Approximately 10% of farmers consulted a veterinarian to treat diseases in their cattle, while 90% relied on local doctors (Mamun *et al.,* 2019). For the treatment of their cattle, 76.3% of respondents took help from a veterinary surgeon (Ahmed *et al.,* 2010).

Marketing

Marketing channels are important as they serve as alternative routes through which products flow from producers to consumers (Kohls and Uhl, 1980). In Bangladesh, most fatteners employ a traditional beef fattening system for cattle marketing during the Muslim festival known as "Eid-ul-Azha" (Islam *et al.,* 2022). Ferdush *et al.* (2023) stated that beef fatteners' most common marketing channel is; Farmer→ Bepari→ Meat seller→ Consumer. Fattened beef cattle marketing started at the producer level and continued until beef reaches to the final consumer. Open bargaining between buyers and sellers determined the price of cattle. Live weight of the cattle is the primary basis of price estimation. Cattle prices mainly depend on the supply of cattle and the presence of buyers in the market, along with size, age, weight, and how beef cattle

are looked at. After a survey in Kishoregonj and Brahmanbaria districts, it was identified that the main marketing channels were: Farmer→ Bepari→ Butcher→ Consumer; Farmer→ Butcher→ Consumer; and Farmer→ Farmer (re-fattening) → Bepari→ Butcher→ Consumer and in case of color preference, black and red-colored fattened beef cattle were given more priority in grading (Hasan *et al.*, 2011). However, Rahman *et al.* (2012) reported that 78% of farmers directly sold their fattened cattle at their local cattle market, while the butchers and neighbors purchased the rest. However, the interference of brokers is a common problem in obtaining actual prices when farmers sell their fattened animals in the local market (Baset *et al.,* 2003; Hasan *et al.,* 2011). A promising sign is that Bengal Meat and Pabna Meat are the two leading industrial meat processing companies entering the market (WorldVision, 2018). Some existing beef marketing channels (Figure 2 and Figure 3) are given below:
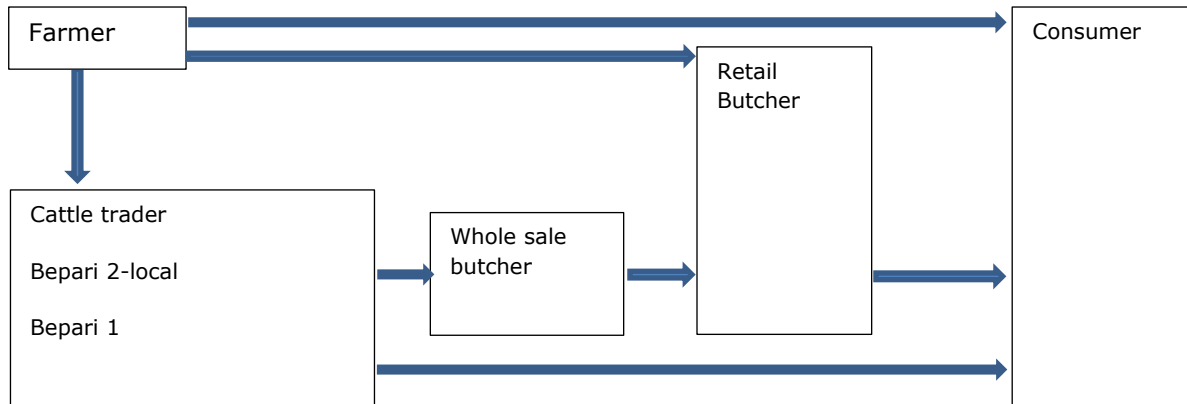

Fig 2: Marketing channel of beef cattle in Bangladesh (Ahmed et al., 2010)
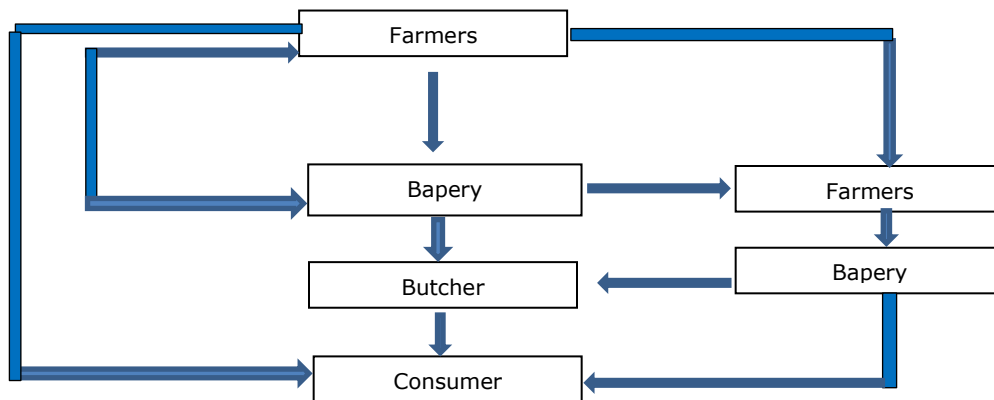

Fig 3: Marketing channel of fattened beef cattle (Hasan *et al.,* 2011).

Carcass

Beef is considered a high source of protein, vitamins and minerals in addition to some bioactive substances (namely conjugated linoleic acid and essential omega-3 polyunsaturated fatty acids) and also contains endogenous antioxidants (for instance, coenzyme Q10, glutathione, lipoic acid, etc.) (Daley *et al.,* 2010 and Williams, 2007). Due to its rich flavors and tastiness, the demand for beef is comparatively high and consumed widely after chicken meat in Bangladesh (Alam *et al.,* 2017). Dental ageing has a significant impact on the grading of Indigenous cattle beef carcasses (Islam *et al.,* 2022). The proximate components of raw beef, including moisture, dry matter, ether extract, ash, and crude protein percentage, in the control group (freshwater) were 73.06±0.03, 26.94±0.03, 10.05±0.04, 8.27±0.06, and 26.79±0.06, respectively (Fatema *et al.,* 2023). Torun *et al.* (2023) stated that water holding

capacity, pH, and cooking loss were 96.2±1.28%, 6.60±0.04, 22.19±0.64% at 52°C, 64.4±0.52%, 6.51±0.02, 45.40±0.78% at 65°C and 24.7±0.36%, 6.65±0.04, 66.03±2.37% at 80°C cooked beef. Variation in diet causes changes in dressing percentage, as well as in the weight of the gastrointestinal tract, of beef cattle (Duarte *et al.,* 2011). Beef cattle raring with concentrate supplementation results in higher live weight gain and hot carcass weight compared with UMS supplemented diet and also improved dressing percentage, increase in KPH (Kidney, Pelvic and Heart fat) Yield, abdominal and back fat thickness by concentration supplementation was found by Rashid *et al*. (2015) and Ribeiro *et al.* (2002). Additionally, Fluharty *et al.* (2009) reported a positive influence of concentrate feed on adipose tissue synthesis. Changing the ratio of forage to concentrate in the diet does not have a significant effect on the proportion of 4 feet, head, and hides (Gabriella *et al.,* 2008). Due to the high digestibility (80-100%) of concentrate feed, supplementing the diet with more concentrate results in lower post-slaughter organ weights compared to a forage-based diet (Fluharty *et al.,* 2009). A similar result in dressing percentage was reported in Crossbred bulls RCC (55.6%), Brahman (55.7%), and Nellore-Angus crossbred cattle (55.2%), providing 50% concentrated base was observed by Roy *et al.* (2013) and Fugita *et al.* (2012). Ribeiro *et al.* (2002) observed a reduction in the level of intramuscular fat in the longissimus muscle of beef cattle fed pasture. Roy *et al.* (2013) reported nearly similar CP and moisture content in meat among three beef breeds: Brahman crossbred, Pabna, and RCC bulls, which were fed a 50% concentrate-based diet in Bangladesh. In comparison to the Indigenous breed, cross-bred animals showed better feed conversion efficiency, with a higher dressing percentage, lower internal fat, and a greater longissimus dorsi muscle area (Baset *et al.,* 2003).

Problems of Beef fattening in Bangladesh

Despite the importance of the beef cattle subsector, livestock farmers face several challenges (Ferdush *et al*., 2023). Supplementation of proper nutrition is considered a major limitation in the cattle production sector in Bangladesh (Baset *et al.,* 2003). Tareque (1985) revealed that among the total available roughages (29.1 million tons) for ruminants, around 23.57 million tons (81%) come from rice straw, while green grass contributes only 1.6 million tons. A high feed price is also a significant obstacle in beef fattening. According to a survey

report by Rahman *et al.* (2012) in three upazilas of the Dinajpur district, 93.3% of respondents identified high feed prices as one of the significant problems in small-scale beef fattening. Other problems, such as the gradual decline of pastureland, insufficient training and loan facilities, price fluctuations, and a lack of an organized beef marketing system, were reported as obstacles to strengthening the beef fattening sector in Bangladesh (Hashem *et al.,* 1999). Providing training to farmers is crucial for enhancing their knowledge and skills in beef cattle fattening, as well as reducing obstacles to sustainable cattle fattening practices in Bangladesh (Rahman *et al.,* 2021; Ferdush *et al*., 2023). According to a survey of 215 respondents covering 52 upazila in 24 districts, Ahmed *et al.* (2010) reported that 79.5% of farmers had not received any training. Barman *et al.* (2017) also stated that in the Rangpur district, only 3% of farmers have training in livestock-rearing practices. Additionally, a portion of beef fatteners (27%) identified cattle disease, especially FMD, as one of the problems associated with beef fattening (Rahman, 2021).

Prospects of Beef Production in Bangladesh

According to DLS data, meat production in the country was 87.10 lakh tones in the fiscal year 2022-23. Bangladesh has a demand of 76 lakh metric tons of meat; however, the country produces more than 87 lakh metric tons of meat annually. Most of the meat is beef (DLS, 2024). Beef fattening in Bangladesh is one of the vital economic activities of farmers. Recently, cattle fattening practices have gained popularity among small-scale farmers in Bangladesh (Hasan *et al.,* 2022, 2021). Additionally, female farmers in Bangladesh have been involved in and sustained beef-fattening programs in rural areas of the country (Islam *et al.,* 2022; Rahman *et al.,* 2012). In Bangladesh, farmers are typically involved in cattle fattening, especially bull fattening, just three to four months before Eid-ul-Azha, and at that time, they can sell the animals at profitable prices. At present, farmers are rearing 41 lakh cattle, which are likely to be brought to markets for sale ahead of Eid-ul-Azha. Of all the cattle processed for meat around the year, half are slaughtered during Eid-ul-Azha, when a significant portion of the fattened bulls are sold. Farmers and livestock officials said that investment in dairy and cattle fattening has increased recently, following India's crackdown on cattle smuggling into Bangladesh since 2014. The restriction resulted in a slump in the supply of livestock from India, which had been a source of

20 lakh cattle per year for Bangladesh earlier. Consequently, over the past five years, the number of farmers engaging in the practice has risen in tandem with the number of bulls (The Daily Star, 2022). There is great feasibility in Bangladesh at rearing and fattening bulls because of high domestic prices and beef prices jumped in the face of the plunge in the inflow of cattle from India, which enables making a profit. In Bangladesh, more than 90% of people are Muslim. During Eid-Ul-Azha (the Muslims' highest religious festival) aligned with the whole year, a vast 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 highly profitable.

Table 2: Threats and Opportunities in Beef Cattle Production in Bangladesh.

Threats	Opportunities
1. Lack of beef breeds	1. Potential demand for beef over the country
2. Lack of standard cattle fattening technologies and feed ingredients at local level	2. Government support to develop beef cattle
3. Lack of veterinary service	3. Domestic and foreign private sector interested to invest
4. Marketing skill and capacity	4. High potential for profitable slaughter and processing business
5. Use of unauthorized growth promoter for cattle fattening	5. High-value addition potential
6. Lack of slaughtering and processing facilities	6. Consumers express more interest and are willing to pay for safe food
	7. Domestic-oriented processing plants have options to differentiate and diversify their products to satisfy some of the untapped markets
	8. Labor-intensive and employment opportunities
	9. Scope exists for developing backward and forward linkage

Source: Sarma and Raha, (2015).

Conclusion

The majority of farmers used their own capital for cattle-fattening enterprises. Indigenous and crossbred uncastrated males are the first priority rather than the emphasis on a particular breed. Depending on the economic condition of farmers, housing varies, though traditional housing is most common. Concentrate with grass is usually used for feeding and the beef cattle marketing system is not well-structured. The development of a breed adapted to subtropical conditions, an adequate supply of inputs, access to information and services, diversification of beef products, and the establishment of proper marketing channels will help build a promising beef fattening industry in Bangladesh.

Authors Contribution

Mohammad Mahbubul: Conceptualization, Design, preparation, revision and finalization; Md. Nazmul Huda: preparation and revision; Mst. Mamata Akter: preparation and formatting of the manuscript; Most. Umme Saleheen Ety: preparation and revision.

Data Availability

With the authors' permission, all relevant data used in this study will be made public.

Conflict of Interest

The authors disclose no conflicts of interest in publishing this research.

Consent for Publication

All the authors agreed and decided to publish this article in the Bangladesh journal of Animal Science.

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