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# TRENDS IN THE HORMONE AND ANTIBIOTIC USE FOR CATTLE FATTENING IN BANGLADESH

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***Abstract***
*The study was conducted to identify trends in the use of hormones and antibiotics, and traditional practices in cattle fattening in the southwest coastal region of Bangladesh. Data were collected from 150 farmers involved in beef cattle fattening through a survey questionnaire. The average numbers of cattle and beef cattle per household were 4.27 ± 1.94 and 3.54 ± 1.31, respectively. An average of 44.67 percent of the beef farmers selected indigenous (zebu) cattle and the rest of the farmers kept a variety of crossbred cattle for fattening. The average age of cattle at the start of fattening was 21.61 ± 8.07 months, the average duration of fattening was 9.71 ± 4.29 months, and farmers marketed cattle at an average weight of 285.50 ± 50.80 kg. The highest percentage (34.67%) of farmers ate beef once a week and 5.33 percent of farmers never ate beef. Among beef farmers, 53.33% and 62.67% applied hormones and antibiotics, respectively, to their beef cattle. The highest percentage of farmers used hormones (33.87%) and antibiotics (29.79%) once a week and the rest of the farmers used them at various intervals. The majority of farmers did not follow any withdrawal period before slaughtering beef cattle for application of hormones (85.48%) and antibiotics (83.58%), whereas the remaining farmers maintained different withdrawal periods. It can be concluded that more than half of the farmers applied hormones and about two-thirds of the farmers used antibiotics for beef fattening, and most of the farmers did not follow the recommended withdrawal periods before slaughter, which is of public health concern.*

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## Introduction

In Bangladesh, the fattening of cattle holds great potential for creating jobs and revenue for the impoverished rural population, particularly tiny, marginal, and landless farmers. It is an alternate strategy for eradicating rural poverty. Small farmers in Bangladesh are increasingly turning to cattle fattening as a means of producing high-quality beef [1]. Additionally, it is a tool for improving rural impoverished people's livelihoods and generating revenue [2]. It was discovered that 8.71 million metric tons of meat were generated in Bangladesh in the fiscal year of 2022–2023 as a result of recent efforts to fatten cattle and raise broilers [3]. The farmers purchase cattle three to six months before the Muslim festival of Eid-ul-Azha, after which they fatten and sell them. Bangladeshi female farmers have been actively involved in and have supported beef fattening initiatives in the nation's rural areas in recent years. The local banks, NGOs, and other credit groups provide loans to female farmers. The cattle fattening industry provided between 30 and 60 percent of the income for rural farmers [4].

Feed additives and growth boosters are supplied into Bangladesh by pharmaceutical companies and foreign marketing agencies, luring farmers to utilize them for animal fattening. According to Islam et al. [4], the majority of cattle brought for sale as sacrifice animals during *Eid-ul-Azha* are purportedly fattened by dishonest cattle traders, who disregard the livestock department's scientific formula, for quick profits and rapid live weight growth. The Fish Feed and Animal Feed Act 2010 of Bangladesh [5] bans the use of steroid hormones and antibiotics, which are forbidden both domestically and internationally, for animals in Bangladesh. A type of steroids is used to quickly increase the weight of the sacrificed animals in the days leading up to *Eid*, as they aim to increase revenue from the cattle trade during the celebration.

It is estimated that 50% of antibiotics used worldwide are used to stimulate animal growth [6]. When administering antibiotics to animals raised for food, care must be taken to ensure that the consequences for humans who eat foods of animal origin are also taken into account [7]. The overuse of these antibiotics in animal husbandry has re-

sulted in the buildup of them in animal tissues in the muscles, heart, liver, and kidney beyond the relative maximum residue levels (MRLs) [8]. The main reasons why drug residues build up in animals raised for food are overdosing, not continuing treatment, inadequate monitoring of withdrawal times, and the use of illegal antibiotics for commercial animal care [9]. One of the hazards to the health of both human and animal bodies is the antibiotic residue. Antibiotic resistance in pathogens affects both humans and animals when farmers and veterinarians improperly administer antibiotics without adhering to the withdrawal period [10]. These issues include teratogenicity, immunopathological effects, carcinogenicity, estrogenic effects, neurotoxicological effects, toxicity, transfer of antibiotic-resistant bacteria to humans [11]. The following objectives were taken into consideration when designing this study, which focused on beef fattening in Bangladesh's southwest coastal districts.

Objectives of the study:

1. To find the trends of using hormones and antibiotics in beef cattle fattening in southwest regions of Bangladesh.
2. To identify the traditional beef cattle fattening program in the southwest coastal region of Bangladesh.

## Objects and methods

*Design of the study*

Data for the current study was collected from the respondents (beef cattle farmers) through door-to-door interviews. Its purpose was to investigate the patterns of hormone and antibiotic use in the Bangladesh's southwest coastal region.

*Locations and sampling of the beef cattle farmers*

Three areas in the Bangladesh's southwest coastal region were used for the study. These were the randomly chosen region of Tala from Satkhira, Fakirhat from Bagerhat, and Dumuria from Khulna districts. A total of 150 farmers who were involved in fattening of cattle and were either ready or willing to provide information were questioned. From each site, 50 farmers were chosen at random. Sampling of the beef cattle farmers to collect the information is shown in Table 1.

**Table 1. Sampling of the beef cattle farmers**

| Sl. No. | Name of locations | No. of cattle farmers |
|---|---|---|
| 1 | Dumuria, Khulna | 50 |
| 2 | Tala, Satkhira | 50 |
| 3 | Fakirhat, Bagerhat | 50 |
| Total | | 150 |

*Preparation of the interview schedule (questionnaire)*

A meticulously crafted interview schedule was devised to elicit pertinent and valuable information from the beef cattle farmers. It had both closed-ended and open-ended questions, all of which had the straightforward format. The questions were designed to be quite simple so that the respondents could answer them with accuracy and ease of understanding. The interview schedule (questionnaire) was pretested with a few farmers of beef cattle once it was prepared. Pre-testing entailed a set of exercises intended to assess a survey instrument's ability to collect the required data; the interview schedule was then multiplied in its ultimate form to facilitate data collection.

*Collection and analysis of data*

Face-to-face interviews with respondents were conducted in accordance with the interview schedule in order to gather data for this study. The goals of the study were described to the respondents before asking any questions, and we asked for their cooperation so that they could provide us with truthful and accurate information. The beef cattle farmers responded based just on their memories because they lacked a written document. Following each interview, the data sheets were examined and confirmed to ensure that the respondents' responses had been accurately recorded. Following the end of the interview, a respondent received appropriate gratitude. To ensure ease and accuracy in achieving the goals, a basic statistical method was employed for data analysis. The data was analyzed using IBM SPSS statistics.

## Results and discussion

*Number of cattle per household*

According to the data in Table 2, there were 3.56 ± 1.58 cattle (including beef, dairy and others) on average per household at the Dumuria area, compared to 3.08 ± 1.16 beef cattle. In the Tala region, there were an average of 4.18 ± 1.90 cattle (including beef, dairy and others), with an average of 3.60 ± 1.36 beef cattle per household. In the Fakirhat region, there were 5.06 ± 2.03 cattle (including beef, dairy and others) and 3.94 ± 1.30 beef cattle per household, respectively.

As per an alternative survey, 42% of farmers raised between two and five beef cattle, 33% between six and nine beef cattle, 18% between ten and twelve cattle, and just 7% raised over 12 cattle for fattening [1]. According to Begum et al. [12], just 3% of farmers raised more than eight cattle, while 70% of farmers raised one to four cattle, 27% raised five to eight cattle. Similarly, 79% of farmers grew 2–5 cattle, 17% raised 6–9 cattle, and only 3% raised 12 or more cattle, as reported by Islam et al. [4].

**Table 2. Average number of cattle per household in three different study areas**

| Locations of the study | Mean ± SD | |
|---|---|---|
| | Total cattle (including beef, dairy and others)/ household | Beef cattle/ household |
| Dumuria of Khulna district | 3.56 ± 1.58 | 3.08 ± 1.16 |
| Tala of Satkhira district | 4.18 ± 1.90 | 3.60 ± 1.36 |
| Fakirhat of Bagerhat district | 5.06 ± 2.03 | 3.94 ± 1.30 |
| Total | 4.27 ± 1.94 | 3.54 ± 1.31 |

*Genotypes of fattening cattle*

Data in Table 3 indicate that the highest percentage (44.67%) of the beef cattle that farmers reared were indigenous (zebu) cattle followed by indigenous × Holstein Friesian crossbred (29.33%), indigenous × Shahiwal crossbred (18.67%), indigenous × Red Sindhi (5.33%) and indigenous × Jersey crossbred (2.0%) cattle.

**Table 3. Genotypes of fattening cattle reared by the beef cattle farmers**

| Genotypes of cattle | Frequency | Percent |
|---|---|---|
| Indigenous (zebu) | 67 | 44.67 |
| Crossbred (indigenous × Holstein Friesian) | 44 | 29.33 |
| Crossbred (indigenous × Shahiwal) | 28 | 18.67 |
| Crossbred (indigenous × Red Sindhi) | 8 | 5.33 |
| Crossbred (indigenous × Jersey) | 3 | 2.00 |
| Total | 150 | 100.00 |

As per Hasan et al. [13], indigenous cattle were raised by 44.44% of farmers and crossbred cattle by 24.44%, while 31.11% of farmers raised a combination of both, which is consistent with the current results. Islam et al. [4] reported that 42.7% of farmers selected indigenous cattle, while 57.3% selected crossbred with the intention of fattening the animals, which is also in agreement with the result of the present study. According to Kamal et al. [14], 26.3% of the farmers chose indigenous cattle, 32.5% chose crossbreeds, and 41.3% chose both local and crossbred cattle for their beef cattle farming. According to Rahman et al. [15], around 60% of farmers fattened their cattle by using both indigenous (zebu) and crossbred animals; 28% used indigenous cattle and 12% used crossbreds. According to Hossain et al. [16], 88% of cattle were crossbred and only 12% were indigenous cattle. The present finding does not match the findings of other researchers [14,15,16]. These differences may be due to different study locations, consumers' demand of the locations, and socioeconomic status of beef cattle farmers.

*Age of cattle at the beginning of fattening*

The data in Table 4 shows that maximum percentage (34.7%) of cattle farmers started the fattening program with cattle between 12 and 18 months of age. Among the remaining farmers, 24.0% started with cattle between 19 and 24 months of age, 20% with cattle between 25–30 months of age, 8.0% with cattle below 12 months of age and between 31 and 36 months of age. Only 5.3% of the farmers started fattening cattle above 36 months of age.

**Table 4. Age category of the cattle for fattening purpose**

| Age of cattle at the beginning | Frequency | Percent | Mean ± SD |
|---|---|---|---|
| <12 months | 12 | 8.0 | |
| 12–18 months | 52 | 34.7 | |
| 19–24 months | 36 | 24.0 | |
| 25–30 months | 30 | 20.0 | 21.61 ± 8.07 |
| 31–36 months | 12 | 8.0 | |
| >36 months | 8 | 5.3 | |
| Total | 150 | 100.0 | |

*Composition of feeds for beef cattle*

Different components of feeds for beef cattle are presented in Table 5. It is shown in Table 5 that the beef cattle were fed composite feeds including rice straw, green grasses, concentrate mix and urea molasses treated straw (UMS) in different combinations. Green grasses comprised of natural grass (*Cynodon dactylon*), Napier (*Pennisetum purpureum*) and German (*Echinochloa polystachya*) grasses. Concentrate mix comprised of maize (50%), wheat bran (22%), soybean meal (25%), dicalcium phosphate (2%) and common salt (1%), and urea molasses treated straw (UMS) comprised of urea (3%), molasses (14%) and rice straw (83%). The results revealed that more than half (50.67%) of the beef cattle farmers fed their beef cattle with a combination of green grasses, rice straw and concentrate mix followed by a combination of green grasses and concentrate mix (17.33%), green grasses and rice straw (15.33%), green grasses, UMS and concentrate mix (9.33%), and rice straw and concentrate mix (7.33%).

According to Mamun et al. [17], the majority of beef cattle farmers (58.3%) provided both cultivated fodder and compound feed. The remaining 1.7% of farmers fed roadside grass to their cattle, while 5% fed both cultivated fodder and cultivated grass, 10% fed both cultivated fodder and mixed feed, and 23.3% fed both cultivated fodder and compound feed. In contrast to straw (17.78%) and planted fodders (26.67%), the majority of farmers provided roadside grass (55.56%) as the source of forages [13]. According to Hossain et al. [16], the majority of farmers (83%) fed their cattle with cultivated fodder, whereas only 17 percent fed their cattle with both roadside grass and cultivated fodder. A number of researchers have recently suggested that feeding cattle on grass-based rations could be a viable choice for fattening cattle [18,19]. For the purpose of fattening cattle, the remaining farmers (44.44%) provided both ready mix and homemade feed mixture. Rashid et al. [20] stated that 55% of feeds were roughage and 45% were concentrate. In their study, 70% of farmers were dependent on natural feed and 30% were solely dependent on market feed. According to Kamal et al. [14], 3.8% of farmers provided only concentrate, whereas 96.3% of farmers provided both roughage and concentrate. In contrast to Buza and Holden [21], who reported that 97.6% of Pennsylvanian survey respondents fed a total mixed ration (TMR), the farmers surveyed by Kamal et al. did not employ any TMR.

**Table 5. Composition of feeds for beef cattle**

| Feed components | Frequency | Percent |
|---|---|---|
| Green grasses* + Rice straw | 23 | 15.33 |
| Green grasses + Rice straw + Concentrate mix** | 76 | 50.67 |
| Rice straw + Concentrate mix | 11 | 7.33 |
| Green grasses + Concentrate mix | 26 | 17.33 |
| Green grasses + UMS*** + Concentrate mix | 14 | 9.33 |
| Total | 150 | 100.00 |

* Green grasses comprised of natural grass (Cynodon dactylon), Napier (Pennisetum purpureum) and German (Echinochloa polystachya) grasses.
** Concentrate mix comprised of maize (50%), wheat bran (22%), soybean meal (25%), dicalcium phosphate (2%) and common salt (1%).
*** UMS (urea molasses straw) comprised of urea (3%), molasses (14%) and rice straw (83%).

*Duration of cattle fattening*

Data in Table 6 indicate that average duration for cattle fattening was 9.71 ± 4.29 months. The highest percentage of the farmers (32.0%) raised beef cattle for a period of 9 to 12 months, followed by 6 to 8 months (30.0%), above 12 months (22.0%) and 3 to 5 months (16.0%). In a similar vein, Kamal et al. [14] discovered that 16.3% of farmers raised fattening animals for three months or less, while the highest percentage of farmers (35%) raised cattle for three to six months, 31.3% for six to twelve months, and the remaining farmers raised cattle for more than twelve months. According to Ahmed et al. [22], 79.1% of respondents thought that the best duration to fatten cattle was between three and six months prior to Eid-ul-Azha, 4.7% thought that the period should be between six and twelve months, and 16.3% said that the period should be more than twelve months. Since most people in Bangladesh are Muslims, Hasan et al. [13] claim that Eid ul Azha is a significant Islamic festival in this country. On the day of Eid ul Azha, devout Muslims offer sacrifices of cattle, buffalo, goats, or sheep. In order to provide their cattle on the cattle market before Eid ul Azha, the majority of farmers (57.78%) fattened their livestock before the festival. Throughout the year, just 42.22% of farms were involved in fattening operations.

**Table 6. Duration of cattle fattening**

| Duration of cattle fattening | Frequency | Percent | Mean ± SD |
|---|---|---|---|
| 3–5 months | 24 | 16.0 | |
| 6–8 months | 45 | 30.0 | |
| 9–12 months | 48 | 32.0 | 9.71 ± 4.29 |
| >12 months | 33 | 22.0 | |
| Total | 150 | 100.0 | |

According to Islam et al. [4], the majority of farmers (53.3%) begin fattening cattle before Eid-ul Azha, with the remaining farmers (47%) fattening cattle all year long. According to the fattening period of the study, 44% of the farmers who fattened beef cattle did so for three to six months, 7% did it only before Eid-ul-Azha, and 24% did so all year long [1]. According to Begum et al. [12], 60% of cattle farmers fattened their animals within three months of Eid ul Azha. Rahman et al. [15] stated that 44.7% of beef producers fattened their cattle for three months, while the remaining farmers fattened their cattle for six months or a year. The majority of livestock caretakers (35%) periodically fatten their cattle for additional cash in a short amount of time [20]. Similar findings were published by Foeken et al. [23], who discovered that urban farmers constantly made an effort to improve their financial situation. Around 65% of farmers carry out the fattening all year long. Most respondents (44.7%) fattened cattle for three months, whereas the remaining respondents fattened cattle for six months or a year, according to Rahman et al. [15].

*Marketing weights of fattened cattle*

Different weight classes of beef cattle at marketing are shown in Table 7. Data in Table 7 indicated that the highest percentage (30.0%) of farmers marketed beef cattle at a weight of between 201 and 250 kg and the lowest percentage at a weight of above 400 kg. The average marketing weight of cattle was 285.50 ± 80.30 kg.

**Table 7. Marketing weights of fattened cattle**

| Marketing weight (kg) | Frequency | Percent | Mean ± SD |
|---|---|---|---|
| 150–200 | 24 | 16.0 | |
| 201–250 | 45 | 30.0 | |
| 251–300 | 24 | 16.0 | |
| 301–350 | 21 | 14.0 | 285.50 ± 80.30 |
| 351–400 | 21 | 14.0 | |
| >400 | 15 | 10.0 | |
| Total | 150 | 100.0 | |

*Consumption frequencies of beef*

The frequency of beef consumption by farmers is shown in Table 8. The data presented in Table 8 revealed that the highest percentage (34.67%) of beef cattle farmers consume beef once a week and the lowest percentage (3.33%) consume it daily. A study conducted by Jahan et al. (2008) indicated that the overall average monthly consumption of beef was about 1.86 kg per household in Bangladesh.

**Table 8. Consumption frequencies of beef**

| Frequencies | Number of farmers | Percent |
|---|---|---|
| Once daily | 5 | 3.33 |
| 2 to 5 times daily | 19 | 12.67 |
| Once a week | 52 | 34.67 |
| Once every two weeks | 37 | 24.67 |
| Once a month | 18 | 12.00 |
| Once a year | 11 | 7.33 |
| No consumption | 8 | 5.33 |
| Total | 150 | 100.00 |

*Use of hormones and antibiotics*

Data collected from three different locations in the southwest coastal region of Bangladesh indicated that more than half (53.33%) of the beef farmers used hormones and 62.67% of the farmers applied antibiotics for fattening cattle (Table 9). According to Islam et al. [4], 70.6% of respondents utilized anabolic steroids in place of growth hormones, while the remaining respondents did not use any form of growth hormones, which is consistent with the present findings. Islam et al. [4] discovered that 95.3% of the farmers used feed additives (antibiotics) to fatten cattle, while the remaining 4.7% used no feed additives at all and the percentage was higher than the current result. On the other hand, 95% of the farmers who fattened their cattle did not utilize any growth promoters during the fattening process, and just 5% of them

used steroids as a growth promoter [13], which is different from the present result. Only 22.22% of the farmers surveyed utilized antibiotics and growth promoters; the remaining farmers did not use any growth promoters throughout the fattening phase [13]. According to Rahman et al. [15], around 34.7% of farmers in the rural areas used beef fattening hormone tablets.

**Table 9. Percentage of the farmers used hormones and antibiotics in cattle fattening**

| Categories | Hormones | | Antibiotics | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Used | 77 | 51.33 | 94 | 62.67 |
| Not used | 73 | 48.67 | 56 | 37.33 |
| Total | 150 | 100.00 | 150 | 100.00 |

According to Barman et al. [12], just 7% of farmers employed growth hormones to make their animals fatter in order to produce meat. Low-income farmers were also reported by Islam et al. [4] to use anabolic steroids more frequently. As per Kamal et al. [14], 58.8% of the farmers used steroids as a growth promoter, while the remaining farmers did not use any form of growth promoters during the fattening phase. According to Rahman et al. [15], 34.7% of farmers utilized hormone pills that fatten cattle.

*Advisers on the use of hormones and antibiotics*

Cattle farmers receive advice on the use of hormones and antibiotics to fatten cattle from various sources. The data presented in Table 10 shows that maximum 59.68% and 45.74% of the farmers were advised to use hormones and antibiotics, respectively, by animal health workers. The second highest percentage of cattle farmers were advised by local doctors to use hormones (27.42%) and antibiotics (25.53%). According to Islam et al. [4], around 49% of respondents used vitamin mineral premix, 26% enzyme, 12% antibiotics, and 13% anabolic steroids for fattening cattle. They also claimed that among advisors of using feed additives in beef fattening 25% were farmers themselves, 50% nearby farmers, 17% NGO employees, and 8% veterinary representatives. According to Kamal et al. [14], it was discovered that 28.8% of farmers were advised to use steroids by beef businessmen, 15% by feed dealers, 8.85% by neighbors, 2.5% by NGO workers, and 3.8% by veterinary medical representatives.

**Table 10. Advisers on the use of hormones and antibiotics for beef cattle fattening**

| Categories | Hormones | | Antibiotics | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Local doctors | 17 | 27.42 | 24 | 25.53 |
| Veterinary doctors | 0 | 0.00 | 15 | 15.96 |
| Animal health workers | 37 | 59.68 | 43 | 45.74 |
| Farmers themselves | 8 | 12.90 | 12 | 12.77 |
| Total | 62 | 100.00 | 94 | 100.00 |

*Farmers' perceptions of the impact of hormone and antibiotic use in beef cattle on human health*

Information on farmers' perceptions of the impact of the hormone use in beef cattle on human health is presented in Table 11. Data in Table 11 shows that the highest percentage (45.33%) of beef cattle farmers did not know about the effects of hormones used on human health, while 14.0% of farmers said that there were no effects, 11.33% said hormones could cause toxicity, 8.67% said they could cause obesity, 7.33% mentioned early maturity and failure of therapy and 6.0% said they could cause breast cancer in humans. Hasan et al. [13] stated that just 22.22% of farmers were aware of the potential health risks associated with steroids, while the remaining 77.78% were unaware of these risks. According to Barman et al. [24], 93% of rural farmers want to increase their profits quickly, despite the fact that 50% of them are unaware of the importance of managing livestock health. According to Rashid et al. [20], 99.5% of people do not believe that using hormones has negative effects. Kamal et al. [14] stated that 98% of farmers believed that steroids had a favorable effect on productivity or growth rate of beef cattle. Merely 30% of farmers were aware of the potential health risks associated with steroids [14].

**Table 11. Farmers' perceptions of the impact of the hormone use in beef cattle on human health**

| Types of impact | Frequency | Percent |
|---|---|---|
| No impact | 21 | 14.00 |
| Failure in therapy | 11 | 7.33 |
| Toxicity | 17 | 11.33 |
| Obesity | 13 | 8.67 |
| Early maturity | 11 | 7.33 |
| Breast cancer | 9 | 6.00 |
| Don't know | 68 | 45.33 |
| Total | 150 | 100.00 |

Data for farmers' perceptions of the impact of the antibiotic use in beef cattle on human health is shown in Table 12. The results revealed that the highest percentage of the farmers (54%) said that they did not know about the impact of antibiotics in beef cattle raising on human health. On the other hand, 14.67% of farmers stated that there is no impact, 12% mentioned failure in therapy, 10.0% said that they are a cause of toxicity and 9.33% farmers stated that they can create multi-drug resistance in human.

**Table 12. Farmers' perceptions of the impact of the antibiotic use in beef cattle on human health**

| Types of impact | Frequency | Percent |
|---|---|---|
| No impact | 22 | 14.67 |
| Failure in therapy | 18 | 12.00 |
| Multi-drug resistance | 14 | 9.33 |
| Toxicity | 15 | 10.00 |
| Don't know | 81 | 54.00 |
| Total | 150 | 100.00 |

*Purposes of the hormone and antibiotic usage in beef cattle by the farmers*

Purposes of the hormone usage in beef cattle by the farmers are presented in Table 13. More than half of the farmers (58.06%) used hormones as a growth promoter followed by 35.48% who used them for quick fattening and the rest 6.45% used for treatment of sick animals.

Purposes of the antibiotic usage in beef cattle by the farmers are presented in Table 14. The highest percentage (36.17%) of farmers applied antibiotics for the treatment of sick animals. The rest 31.91% used antibiotics for growth promotion, 24.47% as disease preventive measures and 7.45% of farmers used them for improving feed efficiency.

**Table 13. Purposes of the hormone usage in beef cattle by the farmers**

| Purposes | Frequency | Percent |
|---|---|---|
| Treatment of sick animals | 4 | 6.45 |
| Growth promotion | 36 | 58.06 |
| Quick fattening | 22 | 35.48 |
| Total | 62 | 100.00 |

Nichols et al. [25] stated that the use of steroid implants in an intensive beef cattle production system boosted average daily gain by 15 to 25% and feed efficiency by 10 to 15%; however, longer-term usage of steroid implants was associated with a decrease in marbling. Growth implants increased ($P < 0.05$) average daily gain by 11.8 to 20.5% in steers, according to Platter et al. [26]. According to Haque and Sarker [27], Bangladesh used a wide variety of steroids extensively for cattle and poultry. Asem-Hiablie et al. [28] found that growth implants were utilized for the production of beef cattle on an average of 30% of US ranches in the northwest and southwest.

**Table 14. Purposes of the antibiotic usage in beef cattle by the farmers**

| Purposes of using antibiotics | Frequency | Percent |
|---|---|---|
| Treatment of sick animals | 34 | 36.17 |
| Disease preventive measures | 23 | 24.47 |
| Growth promotion | 30 | 31.91 |
| Improvement of feed efficiency | 7 | 7.45 |
| Total | 94 | 100.00 |

*Sources of hormones and antibiotics for beef cattle*

Sources of hormones and antibiotics for applying in beef cattle are presented in Table 15. Data revealed that the agents of pharmaceutical companies were the highest (41.94%) source of hormones; however, for antibiotics, the highest source (44.68%) was local veterinary pharmacy. The second highest sources for hormones and antibiotics were local veterinary pharmacy and animal health workers (29.03% and 28.72%, respectively), followed by animal health workers and agents of pharmaceutical companies (22.58% and 20.21%, respectively), and beef cattle buyers (6.45 and 6.38%, respectively).

**Table 15. Sources of hormones and antibiotics for beef cattle**

| Sources | Hormones | | Antibiotics | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| Local veterinary pharmacy | 18 | 29.03 | 42 | 44.68 |
| Animal health workers | 14 | 22.58 | 27 | 28.72 |
| Agents of pharmaceutical companies | 26 | 41.94 | 19 | 20.21 |
| Beef cattle buyers | 4 | 6.45 | 6 | 6.38 |
| Total | 62 | 100.00 | 94 | 100.00 |

According to Islam et al. [4], around 49% of respondents used vitamin mineral premix, 26% enzyme, 12% antibiotics, and 13% anabolic steroids for fattening cattle. They [4] also claimed that advisors for using feed additives were farmers themselves (25%), farmers from nearby farms (50%), NGO employees (17%), and veterinary representatives (8%).

*Pattern of applying hormones and antibiotics in beef cattle*

Data on pattern of applying hormones and antibiotics in beef cattle is shown in Table 16. The highest percentage of beef cattle farmers used hormones and antibiotics once a week (33.87% and 29.79% for hormones and antibiotics, respectively). For hormones, 19.35% of farmers used them once in two weeks followed by farmers who used them once a month (17.74%) and once a year (9.68%). In case of antibiotics, 25.53% of farmers used them daily followed by farmers who used them once a month (12.77%), once in two weeks (11.70%), 2 to 3 times a week (10.64%), once in six months (7.45%) and once a year (2.13%).

**Table 16. Pattern of applying hormones and antibiotics in beef cattle**

| | Hormones | | Antibiotics | |
|---|---|---|---|---|
| Pattern of use | Frequency | Percent | Frequency | Percent |
| Daily | 2 | 3.23 | 24 | 25.53 |
| 2–3 times a week | 5 | 8.06 | 10 | 10.64 |
| Once a week | 21 | 33.87 | 28 | 29.79 |
| Once in two weeks | 12 | 19.35 | 11 | 11.70 |
| Once a month | 11 | 17.74 | 12 | 12.77 |
| Once in six months | 5 | 8.06 | 7 | 7.45 |
| Once a year | 6 | 9.68 | 2 | 2.13 |
| Total | 62 | 100.00 | 94 | 100.00 |

*Withdrawal period of hormone and antibiotic application at cattle slaughter*

Data for the withdrawal period of hormones and antibiotics application at beef cattle slaughter is shown in Table 17. Data revealed that the majority of the farmers did not follow any withdrawal period both for hormones (85.48%) and antibiotics (83.58%) at slaughter. The second largest percentage of farmers (6.45%) maintained the 7-day withdrawal period for hormones followed by the 15-day

(4.84%) and 3-day (3.23%) withdrawal periods. In case of antibiotics, the second longest withdrawal period (7.46%) was 7 days followed by 3 days (5.97%) and 15 days (2.99%). Alarmingly, according to Kamal et al. [14], 55.3% of farmers had stopped using steroids right before marketing, 27.7% had stopped using them before slaughtering, and 17% had stopped using them before a month of marketing.

**Table 17. Withdrawal period of hormone and antibiotic application at beef cattle slaughter**

| Withdrawal period (days) | Hormones | | Antibiotics | |
|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent |
| No withdrawal time | 53 | 85.48 | 56 | 83.58 |
| 3 | 2 | 3.23 | 4 | 5.97 |
| 7 | 4 | 6.45 | 5 | 7.46 |
| 15 | 3 | 4.84 | 2 | 2.99 |
| 30 | 0 | 0.00 | 0 | 0.00 |
| Total | 62 | 100.00 | 67 | 100.00 |

## Conclusion

The results revealed that small and marginal farmers are generally rearing beef cattle in the southwest coastal region of Bangladesh and most of them raise indigenous (zebu) cattle for fattening. The average age of beef cattle at the beginning was 21.61 months, animals were marketed at an average live weight of 285.50 kg and reared for an average of 9.71 months. Farmers fed their beef cattle with different combinations of paddy straw, green grasses, concentrate mix and urea-molasses treated straw. More than half and nearly two-thirds of farmers used hormones and antibiotics, respectively, in beef cattle at varying frequencies. Almost half of the farmers did not know the negative effects of the hormone and antibiotic use in beef cattle on human health, which indicates that there is a need to create awareness among cattle farmers about human health. Most farmers did not follow the withdrawal periods for hormones and antibiotics at slaughter, which is a public health concern. It can be concluded that in the southwest coastal region of Bangladesh, small- and medium-scale cattle farmers apply hormones and antibiotics at different frequencies without following a withdrawal period. This problem can be solved by supporting cattle farmers by creating awareness and providing an appropriate technology for cattle fattening.

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