

STUDY OF CATTLE FATTENING SYSTEM IN SELECTED REGION OF BANGLADESH

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Abstract

The current study was undertaken to assess the present status of cattle mixed feeds, feed ingredients and use of growth promoters in livestock production of Bangladesh. The survey was carried out through a structured questionnaire among 80 farmers during April to June, 2017. The study revealed that agriculture is the primary occupation for 63% of respondents, whereas 27.5% of respondents are dependent over livestock. The dairy farmers are involved in both dairy and beef cattle fattening. Approximately 64% of the livestock farmers practiced fattening round the year and rest of the respondents followed fattening for period of 3 months; before Eid-ul-Adha. About 86% farmers reared uncastrated males instead of steer for fattening. It was observed that 59% of the farmers applying steroid as growth promoters in beef cattle fattening. The study indicated that middleman, feed/ medicine dealers were involved in promoting of steroids (dexavet, pednivet, oradexon, decason, paractin, gludex etc) usages in livestock. Owing to the lack of knowledge on steroids use in livestock over public health, the farmers are influenced by the vendors for quick profit. They sell their animals prior to withdrawal periods of drugs. Training and knowledge about the health hazards of steroids had inverse significant relationship with use of steroid as growth promoter ($p < 0.01$). Improvement of education, training and financial status of the farmers significantly affected the use of steroids in beef fattening. Present problems could be addressed by intervention measures by the policy makers of the livestock sector.

Keywords: Growth Promoters, Fattening Cattle, Steroids

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INTRODUCTION

In Bangladesh, livestock is one of the most important sub-sectors of agriculture which plays a vital role in promoting national economy of the country (Sarma et al., 2014). About 80 to 85% of the households keep livestock in the rural areas and most of them are landless, marginal and small farmers (Hossain et al., 2004). Livestock may be considered as “Cash income” to rural farmers that is instantly available for sale or barter (Hossen et al., 2008). Cattle fattening for beef production have become an important business of the small farmers in Bangladesh. Now it is necessary to find out the limitations of existing beef production system to make it more sustainable at farmer’s level. It was suspected that stimulating substances like, steroids, feed additives etc. were using in Bangladesh. (Islam et al., 2012). Experts believe that cattle feed shortages have been a major limitation to improve cattle productivity in Bangladesh. Besides, there is a festival demand of beef cattle during Eid-ul- Adha. To fulfill the animal protein requirement and poverty alleviation for rural people, cattle fattening can play a significant role. In Bangladesh, feed additives and growth promoters imported by pharmaceutical industries and overseas marketing agencies and attract farmers to use them in fattening animals. Most of the cattle brought for sale as sacrificial animals in the northern districts ahead of Eid-ul-Adha are fattened allegedly by unscrupulous cattle traders ignoring the scientific formula prescribed by Livestock Department for rapid live weight gain and quick profits (Islam et al., 2012). Apparently, the animals look very attractive, muscular and high live weight but the consumers are very disappointed by deception and cheating. Some of them may have harmful residual effects on human health or some may not respond cost effectively. For over 25 years, the use of hormonal substances has been banned in animal production in Europe (Council Directive 88/146/EEC). Recently, there has been plenty of attention paid to the occurrence of veterinary drug residues in animal-food products.

METHODOLOGY

Selection of the study area and preparation of interview schedule

The data was collected through an interview schedule from the farmers of 4 districts (Gazipur, Mymensingh, Sirajgonj and Rajshahi) of Bangladesh, for having high cattle population in those areas. The respondents were selected who rear cattle or bought cattle for fattening or rearing. Respondents those are involved in cattle fattening purpose were randomly chosen from each upazila.

Collection of data

Data were collected following direct interviews and making personal visits from beef cattle farmers. Key informant interview (KII) was done with government livestock officers and feed dealers.

Parameters studied

The interview schedule contained general information (occupation, education, family member etc.) of the cattle owners, livestock population, management of the fattening cattle, feeds and feeding cattle, indigenous knowledge on rearing and marketing of cattle, and the application of steroid and feed additives, feed ingredients, feeding and animal management.

Computing and statistical analysis of data

Descriptive analysis was done, like average and percentages as well as spearman correlation coefficient (r_s), level of significance through SPSS Statistics 17.0. Spearman correlation coefficient is measured by following formula,

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}.$$

Where ,

- $d_i = \text{rg}(X_i) - \text{rg}(Y_i)$, is the difference between the two ranks of each observation.
- n is the number of observations

RESULTS AND DISCUSSION

Socio-economic background of the farmers

There are many interrelated and constituent attributes that characterize an individual and form an integral part in the development of one's behavior and personality. Farmer's educational level, income and sources of money influence the cattle production system because uneducated and poor farmers intend to get more profit by investing less money in the illegal way such as, use of harmful growth promoter.

Table 1. Socio-economic background of the farmers

Parameters	Categories	% of farmers
Main occupation	Agriculture	63.8
	Livestock. Business	27.5
	Services	2.5
	Others	6.3
Level of education	Illiterate	33.8
	Primary	32.5
	Secondary	13.8
	Higher secondary	7.5
	Above	12.5
Family member	2-4	3.8
	5-7	53.8
	8-10	40
	>10	2.5
Annual income (BDTK)	20000-30000	5
	31000-40000	26.3
	41000-50000	40
	>50000	28.8
Sources of money	Own	51.3
	Bank loan	23.8
	NGO loan	20
	From Mohajon	5
	Others	
Training on cattle fattening	Have	23.8
	Have not	76.3

Table 1 revealed that the majority (63.8%) of the respondents had main occupation as agriculture, 27.5% were related in the livestock business. About 51.3% of the farmers run their cattle fattening business by own money, 20% from NGO loan, 23.8% bank loan, 5% taken loan from mohajon. In case of training, only 23.8% respondents had cattle fattening training and 76.3% farmers whom had not any training on cattle rearing and corroborated with the earlier findings (Ahmed et al., 2010; Rahman et al., 2012; Islam et al., 2012). Currently, higher educated (graduation) people are attracting towards the livestock business then before (Hossen et al., 2008; Sharma et al., 2014 and Rahman et al., 2012). The result of this study contradicted the earlier

findings of Begum et al. (2007), where the authors reported that 86.7% farmers used own capital. From these above statements it was revealed that now farmers get more loans from bank, NGOs and other financial institution. Reports on similar studies were also available from different authors (Ahmed et al., 2010 and Rahman et al., 2012).

Factors associated with cattle rearing

It was revealed that 32% of farmers selected beef type cattle for fattening purpose and the rest of them selected dairy and beef for rearing (Table 2). The result of this study was not similar to Islam et al. (2012) where they showed that majority (92%) of farmers selected beef type cattle for fattening purpose. We surveyed all types of farmers where only large farmers reared beef type cattle only for beef fattening. Among the farmers, 26.3% selected indigenous and 32.5% farmer's selected crossbreeds and 41.3% select both crossbreeds and local for their farm (Table 2). Rahman et al (2012) reported that about 60% farmers used both deshi and crossbreeds cattle for fattening, 28% deshi and 12% used crossbreeds. Hossain et al (2016) stated that about 12% cattle were indigenous and 88% crossbred in origin.

Table 2. Factors associated with cattle fattening

Parameters	Categories	% of farmers
Farm type	Beef type	42.5
	Dairy type	
	Beef + Dairy	57.5
No. of cattle for fattening	2-5	27.5
	6-9	33.8
	10-12	22.5
	>12	16.3
Breed of cattle	Indigenous	26.3
	Crossbreeds	32.5
	Both	41.3
Pattern of the program	Just before Eid Ul Adha	30
	Round the year	63.8
	Seasonal	6.3
Fattening period	3 months or less	16.3
	3-6 months	35
	6 months-1 year	31.3
	>1 year	17.5
Sex of animal	Castrated male	13.8
	Uncastrated male	86.3

The pattern of cattle fattening from the present study indicated that 30% farmer practiced fattening only before Eid-ul-Azha, 63.8% farmer practiced fattening round the year and the rest of the farmers perform seasonal fattening (Table 2). Islam et al. (2012) showed that majority (53.3%) of the respondents start fattening before Eid-ul-Azha and the rest practiced round the year. Fattening period was the most important factor because it measured profit percentage of the respondents. Among the farmers 16.3% farmers practiced fattening for 3 months or less and maximum number farmers (35%) farmers fattening period was 3 to 6 months and 31.3% farmers fattened their cattle for 6 months to 1 year and the rest above 1 year (Table 2). Ahmed et al. (2010) stated that 79.1% respondents found that the fattening period of cattle was 3-6 months. Rahman et al. (2012) stated that most of the respondents fattened cattle for 3 months (44.7%) and rest fattened for 6 months or one year. Sex is the crucial point for fattening, because customer chooses the meat of male beef cattle more than female cattle. Majority (86.3%) of them selected uncastrated male and rest of them fattened castrated male (Table 2). Starting age of cattle fattening also varied farmer to farmer. Islam et al. (2012) reported that majority (80.7%) of them selected uncastrated male and rest of them fattened castrated male.

Information about steroids and feed additives

Among the respondents 58.8% farmers practiced using steroid as a growth promoter and rest of them did not practiced any kinds of growth promoter at the period of fattening (Table 2). Rahman et al. (2012) observed that about 34.7% farmers used beef fattening tablets. Islam et al. (2012) reported that among the respondents 70.6% used anabolic steroid as a growth promoter and rest of them did not use any kinds of growth promoter. Use of growth promoter was decreasing day by day due to training of farmers. Only 30% farmers had the knowledge about health hazard effect of steroid (Table 3).

It was found that 28.8% farmer got information of steroids from mohajon, 15% from feed dealer, 8.85 from neighbor, 2.5% from NGO worker and 3.8% from medical representative. About 58% farmer use steroid (drugs) in cattle fattening (Fig. 1). 55.3% farmer had withdrawn steroid immediately before marketing, 27.7% withdraw immediately before slaughtering and 17% before one month of marketing which was alarming (Fig. 2).

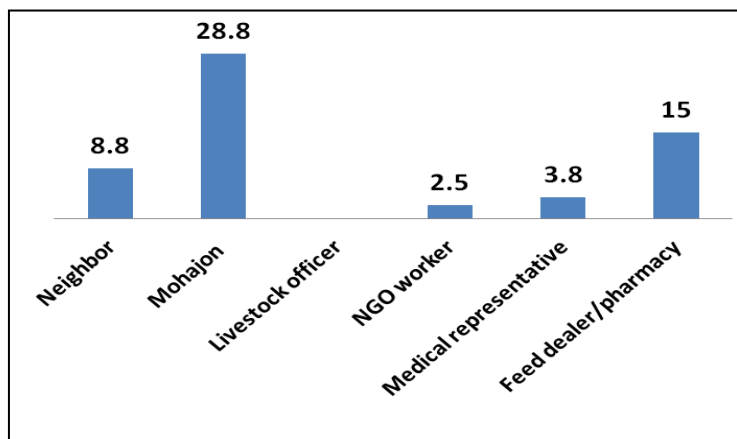


Fig. 1 Source of information to use steroids

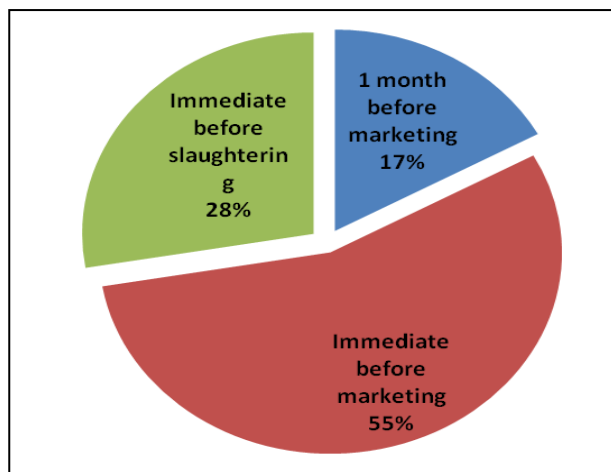


Fig. 2 Withdrawal period of steroid

Table 3. Information about steroids and feed additives

Parameters	Categories	% of farmers
Use of steroid	Yes	58.8
	No	41.3
Impact of steroid on growth rate (farmers opinion)	Yes	97.9
	No	2.1
Knowledge about health hazard effect of steroid	Have	30
	Have not	70
Knowledge about feed act	Have	12.5
	Have not	87.5

98% farmers thought that steroid had positive impact on growth rate or production (Table 3). Nichols et al. (2002) reported that in an intensive beef cattle production system use of steroid implants increased average daily gain by 15 to 25% and feed efficiency by 10 to 15% but decreased in marbling was observed due to longer use of steroid implants. Platter et al. (2003) found that use of growth implants increased ($P < 0.05$) average daily gain by 11.8 to 20.5% of steers. Haque and Sarker, (2014) reported that different types of steroids were used rampantly for poultry and bovine in Bangladesh. Asem-Hiablíe et al. (2017) stated that in an average 30% of northwest and southwest ranches of United States used growth implants for beef cattle production.

Information about feed and cattle management

Table 4. Information about feed and cattle management

Parameters	Categories	% of farmers
Type of feed given	Roughage	-
	Concentrate	3.8
	Both roughage and concentrate	96.3
	TMR	-
Roughage	Straw	8.8
	Roadside grass	61.3
	Cultivated fodder	30
Concentrate	Compound feed/ Pellet	18.8
	Hand mixed feed	33.8
	Both	47.5
Preservation/Treatment	Hay	1.3
	Silage	-
	Urea molasses block	-
	Urea treatment	30
	None	68
Parameters	Categories	% of farmers
Rearing system	Intensive	30
	Semi-intensive	51.3
	Extensive	18.8
Sources of water	Safe	48.8
	Unsafe	51.3
Ration formulation	By own	72.5
	Consultant/Technical people	27.5

Presented result (Table 4) showing that, 96.3% farmers gave both roughage and concentrate and 3.8% farmer gave only concentrate. They did not use any total mixed ration (TMR) which was not similar with Buza and Holden, (2016) where they reported that in Pennsylvania, 97.6% survey respondents fed a total mixed ration. 61.3% farmer gave roadside grass as the source of roughage, 8.8% gave straw and 30% gave cultivated fodder as the source of roughage (Table 4). Hossain et al. (2016) reported that most of the farmers (83%) used cultivated fodder and only 17% farmers used cultivated fodder and roadside grass during rainy season.

As a source of concentrate, 18.8% used commercial pellet feed, 33.8% used hand mixed feed which was made by different raw materials found locally and 47.5% gave both pellet and hand mix feed (Table 4). Among the farmers only 30% farmer treated straw with urea and rest of the farmers didn't follow any treatment (Table 4). In case of rearing system 30% followed intensive management, 51.3% followed semi-intensive management, and 18.8% followed extensive management system (Table 4). García-Torres et al. (2016) found that consumer chose beef produced from intensive organic farming at sensory level and grass-fed or extensive organic farming at the point of purchase. Most of the farmers (72.5%) did their ration formulation by own and the rest from the technical person (Table 4). For this reason, maximum animal doesn't get proper nutrition for maintenance and production.

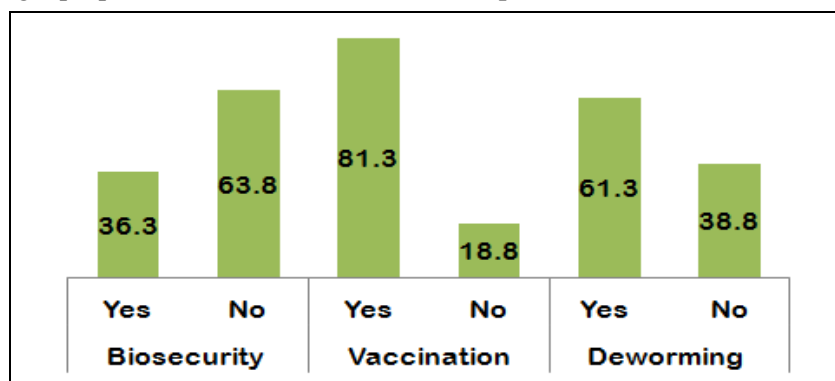


Fig. 3 Biosecurity measures

Only 36% farmer maintained biosecurity measure in their farm which is not satisfactory (Fig. 3). The term 'biosecurity' includes various types of measures that farmers can perform to lessen the risk of spread out of pathogen (Cardwell et al., 2016). 72% farmers thought that biosecurity measures was important for their farm and 53% farmer thought that they had lack of knowledge of biosecurity, reported by Sayers et al. (2013). 81.3% farmers gave vaccine to their animal and 61.3% performed deworming (Fig. 3) which was similar with Begum et al. (2007) and Ahmed et al. (2010). About 48.8% animals get safe water (Table 4). It was vital that cattle should be provided drinking water by the farmers to ensure safety and it was

considered as good practice. According to the survey, only 28.8% farmers cultivated fodder for their animal (Fig. 4).

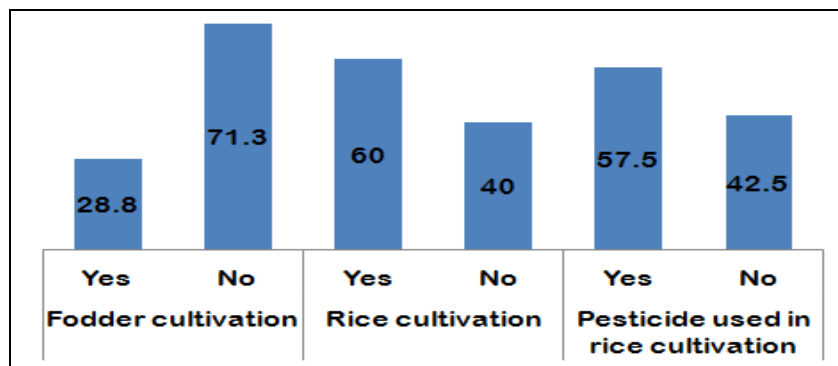


Fig. 4 Fodder cultivation

Hossain et al. (2016) reported that most of the farmers (83%) used cultivated fodder and only 17% farmers used cultivated fodder and roadside grass during rainy season. About 60% farmers cultivate rice and among them near about 57% farmer apply pesticide (Fig. 4). Straw, rice polish, broken rice are the main by product of rice which may contain those pesticides. It is hypothesized that pesticides residues will be found in rice by-products which will be used as livestock feed.

Relationship of use of steroids with other factors

Table 5 revealed that the different parameters such as sex, occupation, annual income, source of money, farm type, breed type, and no. of cattle fattened, fattening period, training, health hazard of steroid etc. were considered as influencing practice of steroid use in the small scale cattle rearing. Significant ($p < 0.05$) association was observed (Table 5) on the use of steroids with different sex, occupation, education level, annual income, breed of cattle, training of farmer and knowledge about health hazards of steroid. The chi square value of education was 12.367 indicating (Table 5) that with the increase of level of education of farmer was associated with decrease of steroids which was significant ($p < 0.05$). The x^2 -value of annual income was 8.396 indicating that with the increase of annual income was associated with the decrease of steroids was significant ($p < 0.05$).

Table 5. Relationship of use of steroids with other factors

Parameter	Categories	Spearman correlation coefficient (r_s)	Level of sig.
Sex	Male	0.274	0.026 (*)
	Female		
Main occupation	Agriculture	0.370	0.007 (**)
	Liv. Business		
	Services		
	Others		
Education	Illiterate	0.319	0.015 (*)
	Primary		
	Secondary		
	Higher secondary		
Annual income	20000-30000	0.212	0.039 (*)
	31000-40000		
	41000-50000		
	Above 50000		
Sources of money	Own	0.080	0.096 (NS)
	Bank Loan		
	NGO Loan		
	Loan Mohajjn		
Farm type	Beef	-0.050	0.413 (NS)
	Dairy		
	Beef & Dairy		
Breed of cattle	Indigenous	-0.313	0.002 (**)
	Cross		
	Both		
Pattern of program	Eid-ul-Adha	0.042	0.897 (NS)
	Round the year		
	Seasonal		
Fattening period	3m or less	0.251	0.082 (NS)
	3 to 6 m		
	6m to 1 year		
	Above 1 year		
Training	Have	-0.368	0.001 (**)
	Have not		
Health hazard of steroid	Know	-0.560	0.000 (**)
	Don't know		

r_s =Spearman correlation coefficient; NS, Non-significant ($p>0.05$); *= $p<0.05$, **= $p<0.01$

The r_s value of sex, occupation, education, annual income was positively correlated with steroid practiced and had a significant ($p < 0.05$) positive relationship with steroid use. The r_s value of source of money, pattern of program, fattening period had a positive correlation but weakly ($r_s < 0.3$) correlated (Table 5) which was not significant ($p > 0.05$). Here we can say that poor and uneducated people are more suspected to use different steroid in illegal way to get more profit. The r_s value of training was -0.368, it indicates the use of steroids was increased with the decreased farmer training which was significant ($p < 0.01$). Again r_s value of knowledge about health hazard of steroid is -0.560, it indicates that the use of steroid increased with the lack of knowledge about health hazard of steroid which was significant ($p < 0.01$).

Available steroids in Bangladesh

During the study we have found that injection for veterinary purpose used as growth promoter. Again tablet for human medication (Paractin, Gludex) used in beef fattening frequently in different areas of Bangladesh. All these are drugs; depending on their dosages they impact kidney functions, sometime lessen urination, make body tissue edematous; excessive dose causes death of animals sometimes.

Table 6. Common drugs / steroids found during the study

Injection	Tablet
Dexavet (Synthetic steroid)	Paractin (for human medication but used for fattening)
Pednivet (Steroid)	Gludex (Dexamethasone for human)
Oradexon (Glucocorticoid steroid)	Pednivet (Steroid)
Decason (Glucocorticoid steroid)	
Tredexanol (Synthetic steroid)	

CONCLUSION

In the majority of villages in Bangladesh, farmers rear beef cattle for fattening without having any scientific knowledge. Some drugs/steroids are being used for fattening purposes which are prohibited as per feed act rule of Bangladesh. Farmers are not getting proper training on production and management practices of beef cattle fattening. Details studies on different contaminants in cattle feed are needed to produce quality and safe beef.

Conflict of interests

The authors declare that there is no conflict of interest.

ACKNOWLEDGEMENTS

This research work has been conducted with the financial aid of “Feed Safety and Nutrition of Cattle in Bangladesh: Using Total Mixed Rations for Beef Production in Intensive System (Zero Grazing)” project under the MoU between “Bangladesh Agricultural University” and “Ismail Feeds and Animal Enterprise limited”.

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