



Socio-economic importance and rearing system of goat in south-western part of Bangladesh

A Rahman¹, MA Ali², MAH Sarkar¹, MA Islam¹, NG Saha³, MT Hasan⁴ and T Chanda⁵✉

¹Department of Dairy Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh;

²Department of Poultry Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh;

³Department of General Animal Science and Animal Nutrition, Patuakhali Science and Technology University, Patuakhali-8602, Bangladesh; ⁴Department of Livestock Services, Ministry of Fisheries and Livestock, Dhaka;

⁵Department of Dairy Science, Patuakhali Science and Technology University, Patuakhali-8602, Bangladesh.

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Correspondence:

Tanni Chanda

✉: tanni@pstu.ac.bd

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ABSTRACT

The experiment was carried out in the south-west region of Bangladesh to understand the general goat husbandry practices and the socioeconomic significance of goat farmers. Through a face-to-face interview with these rural farmers, information was collected from a total of 100 goat farmers at random in five Upazila in the Kustia district. The majority of the farmers were illiterate and middle-class, and their main source of income was agriculture. In this region, 14% of farmers involved in goat rearing mostly raised Black Bengal goats (84%) and crossbred goats (9%). Both buck and doe were reared by 67% of the farmers. Most of the farmers (92%) practiced a semi-intensive rearing system. Among the farmers, 88% did not use bamboo or wooden platform inside houses. The farmers fed their goats green grass, green grass with straw and green grass with concentrates at 70%, 11%, and 19%, respectively. Only Napier Pakchong (43%) and German (22%) fodders were cultivated whereas 92% of farmers practiced no methods. On rainy days, the goats were nourished mostly on tree leaves and 93% of farmers did not practice their goats a winter bath. Most of the goats in the study areas were affected by pneumonia (59%) and PPR (24%) with pneumonia having a high mortality rate (28%). A good portion (87.67%) of farmers practiced vaccination against PPR. The burial method for disposal of carcasses was followed by 96% of farmers. Most of the farmers (92%) gave the anthelmintic drug to deworm their goats. These results suggested that proper training is essential for better rearing and management of goats.

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Introduction

The economy of Bangladesh is substantially impacted by Livestock notably the subsectors dealing with cattle, poultry and goats. The majority of goats raised are Black Bengals, which are known for their prolificacy, fertility and early sexual maturation as well as their adaptation to hot and humid climates (Hossain, 2021). In addition, the Jamuna Pari breed and crossbreed are also accessible in this country. Goats are a type of small livestock known as the "poor man's cow" because of their enormous economic value to the underprivileged (Ribeiro *et al.*, 2010). Goats are frequently raised in rural regions on tree leaves,

twigs, and bushes since they require less feed than cattle. Since the beginning of civilization, goats have been a common sight on rural farms and because of their gentle nature, women and kids can easily care for them in addition to doing their regular work. The goat is a multipurpose animal and greatly improves Bangladesh's rural economy. It is vital to the livelihood of many small farmers, especially women, landless people, and marginal farmers in remote locations who seldom have access to other sources of income (Choudhury *et al.*, 2012). Approximately 90% of goats is black Bengal (Jalil *et al.*, 2018), and 26.6 million goats are kept by rural populations in Bangladesh (DLS, 2021). People use a

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traditional scavenging system with 2-5 goats per farmer, mostly women. Goats are valuable assets and prepared to provide income in times of need, and they play a significant role in the livelihoods of smallholder farmers in Bangladesh (Akhter *et al.*, 2006). Some of Bangladesh's poorest people are supported by goats in a special way that can help them escape poverty and achieve success (Amin, 2000). Goat farming is getting more and more attractive as a result of the rising demand for animal products. There is a need to create a scientific way of goat keeping without having a negative influence on the environment because goat farming is often the only means of life for many women in remote areas (Hossain *et al.*, 2015). Goat rearing is the most popular activity among middle-class and upper-middle-class families (Sato, 2011). Higher goat mortality is a result of improper care and generally faulty husbandry practices in the current production system. The main obstacle to goat production in rural areas is thought to be the high rate of kid mortality (Kashem *et al.*, 2011). Therefore, this research work was designed and conducted to explore in-depth knowledge about the goat husbandry practices in the south-west part of Bangladesh.

Materials and Methods

Study area

Five Upazila in the Kustia district namely Kushtia Sadar, Kumarkhali, Daulatpur, Bheramara, and Khoksa Upazilas selected for data collection. The Kustia district can be found between 23° 54' 10.08 north latitude and 89° 07' 9.95 east longitudes. This area was selected due to the presence of a large number of goats and the researchers were familiar with the area and local language. In that region, most of the farmers lead their livelihood through agriculture and goat husbandry.

Data collection and analysis of data

Data were collected by using a pre-structured questionnaire and direct random interviewing. Five farmers from each of the twenty villages were chosen at random to represent the 100 farmers who were interviewed. The survey was conducted in the month of March to April 2021.

The objectives of the study were carefully considered when creating the structured interview schedule. The questions and sentences in the schedule were simple, direct, and easy for the respondents to understand. Prior to collecting data, the respondents were informed of the study's objective certainly. Data

on the socioeconomic status of farmers, including their sex, age, type of farming, education, land use, and source of income as well as information on goat husbandry, including their rearing system, housing, breed, type of goat, breeding method, drinking, feeding and fodder cultivation, feed source was collected. Eye observation of the farm and the shed provided information about the circumstances of the goat shed. The collected data were compiled, tabulated and analyzed by SPSS software version 2020 to measure frequency and percentage.

Results and discussion

Socio-economic status of farmers

Table 1 indicate the socio-economic condition of farmer in Kushtia district of 100 farmers. In this area about 95% of goat raiser was women and only 5% were men. 3% of goat raiser was below 25 years old and 97% more than 25 years old. The majority of goat raisers were illiterate (59 %) and 34% passed primary education whereas only 2% of farmers passed SSC in that area. The results support those of Islam *et al.* (2018) and Tanwar *et al.* (2010) who discovered that the majority of goat farmers lacked a high school diploma. According to Kumar *et al.* (2018) and the majority of goalkeepers have a primary occupation in agriculture and raise goats as a side business. The majority of goat farmers, according to Islam *et al.* (2018) were in the medium age bracket, followed by senior farmers and young farmers, which is somewhat similar to our findings. The farmer type was categorized on the basis of land by very poor (landless), poor (less than 30 decimal), and middle classes (more than 30 decimal). However, more than 61% was middle-class farmer whereas 16% and 23% were very poor and poor-class farmer, respectively. The main income source of that farmer was agriculture (59%) followed by goat rearing (14%), cattle rearing (1%), local business (5%), day labor (4%), job 10%, and auto rickshaw driving 7%. Goat rearing (14%) is dominant as compared to other livestock populations especially cattle rearing (1%) in this area. The findings of this survey are comparable to those of (Sarker, 2014) who claimed that 50% of farmers were active in agriculture, 23% were in business, and 23% held another type of employment. As a primary or secondary occupation, goat farming is connected to about 65% of households (Chowdhury *et al.*, 2015). For the husbandry of goats, some farmers (16%) were trained by government organizations as well as different

Socio-economic importance and rearing system of goat

NGOs. However, the majority of farmers did not have access to any training for goat rearing.

Breed and breeding method of goats

Table 1. Socio-economic condition of farmers

Parameters	Category	Respondents (n=100)	Percentage
Sex of farmer	Male	5	5
	Female	95	95
Age	<25 years old	3	3
	>25 years old	97	97
Education level	Illiterate	59	59
	Primary	34	34
	SSC	7	7
Source of main income	Agriculture	59	59
	Goat rearing	14	14
	Cattle rearing	1	1
	Local business	5	5
	Day labor	4	4
	Job	10	10
	Auto rickshaw	7	7
Training for husbandry of goat	Yes	16	16
	No	84	84
Farmers type	Very poor (landless)	16	16
	Poor (<30 decimal land)	23	23
	Middle class (>30 decimal land)	61	61

Table 2. Breed, type and breeding method of goats

Parameters	Category	Respondents (n=100)	Percentage
Breed of goat	Black Bengal	84	84
	Crossbred Goat	9	9
	Jamuna Pari	7	7
Types of goat	Buck	3	3
	Doe	1	1
	Both Buck and Doe	67	67
Breeding method	Buck, Doe and Wither	29	29
	AI	1	1
	Natural	97	97
	Both AI and Natural	2	2

There are about 30.33 million goats in Bangladesh and Black Bengal goat accounts for more than 90% of the total population; the remaining ones include Jamuna Pari and their crosses (Jalil *et al.*, 2018). Table 2 indicates that about 84% of goats were Black Bengal, 9% were crossbred goat and 7% were Jamuna Pari. The crossbred goat is produced by breeding between Black Bengal and Jamuna Pari. However, in the survey area, very few people about 3% and 1% farmers kept only buck and doe respectively. The majority of the farmers (67%) reared both buck and doe together, and 29% farmers had buck, doe and wither their house.

In Bangladesh, natural breeding is mostly practiced in the case of goat breeding. In the survey area, it was clearly shown that about

Breed and types of goat

The Black Bengal is an indigenous breed of goat in Bangladesh. Its hide is very popular around the world known as Kustia grade.

97% of breeding was natural and there only 1% of farmers bred their goat by Artificial Insemination (AI) (Table 1). According to Sarker (2014), all farmers used natural breeding to produce sheep.

Housing and rearing system of goat

Table 3 showed that about 92% of farmers raised their goats in semi-intensive system whereas only 6% and 2% of farmers reared goats in the intensive and free-range systems, respectively. Islam *et al.* (2009) found that the majority of farmers (80.5%) raised goats in a semi-intensive system, while only a small percentage of farmers (7.3%) raised goats in a free-range system. Most of the farmers did not use bamboo or wooden platform inside the house. In this survey, about 88% of farmers did not build platforms inside the shed. However,

only 12% of farmer-built bamboo platforms are above the ground level inside the shed. There is a good indication that about 80% of farmers built separate goat houses as night shelters in the survey area but only 18% of farmers kept goats with other animal such as sheep and cattle house and 2% kept goats on the veranda of farmer house. 75.6% of farmers kept goats inside a goat house at night. Since the cold is a goat's biggest adversary, the majority of farmers (93%) did not bathe their goats during the winter. While only 1% of farmers gave their goats a wintertime shower, about 6% of farmers practiced bathing their goats once a month.

Table 3. Housing and rearing system of goat

Parameters	Category	Respondents (n=100)	Percentage
Rearing system	Confinement	6	6
	Semi intensive	92	92
	Free range	2	2
Bamboo/ wooden platform used in the house	Yes	12	12
	No	88	88
Night shelter	Goat house	80	80
	Sheep or cattle house	18	18
	Veranda	2	2
Bath at winter	Once a moth	6	6
	Once per two weeks	1	1
	No	93	93

Feeding and drinking system of goats

Goat is a small ruminant animal that consumes a very small amount of feed per day as the goat is good grazer as well as a browser. Table 4 indicates that 70% of feed was fed to a goat with green grasses that were grown on the roadside, on crop fields, and from any unused land. However, 19% of feed was fed to goats with green grass together with concentrate and only 11% of feed was straw with green grasses as a feed source for goats in the survey area. According to Hossain et al. (2015), green grass alone, green grass plus straw, and green grass plus concentrate feeds were used by 61%, 19.5%, and 19.5% of goat producers, respectively. Usually in rural areas of Bangladesh farmers do not cultivate grass for goats but for cattle. But in the survey area, Napier puncheon (43%) and German grass

(22%) were cultivated as feed sources. On rainy days farmer kept their goat inside goat houses to prevent rain and at that time they generally fed their goat with tree leave (58%), green grass (18%), and leaves with concentrate (21%). Among 100 farmers, 76% did not use feeders. Maximum farmers (83%) did not clean feeders and drinkers regularly. About 92% of farmers did not practice any feeding technology. Only 7% and 1% of farmers made urea molasses treated straw and urea molasses block, respectively to feed goats in the feeding system. In the survey area fattening of goats was very rare. For the fattening of goats, 99% of farmers did not use any steroids. They usually practiced fattening of goats by feeding local green grass and concentrating feed before some festival in Kustia district. Tube well (45%), pond water 47%, and supply water 8% were the source of drinking water in that region.

Disease prevalence, vaccination, treatment, de-worming and disposal method

Goat is affected by many diseases in Bangladesh. Diseases such as anthrax (6%), Peste des petits ruminants (PPR) (24%), diarrhoea (11%), and pneumonia (59%) were common in the survey area (Table 5). Among diseases, pneumonia was a more common disease. Pneumonia, PPR, contagious ecthyma, diarrhoea, and tetanus are more prevalent illnesses in rural locations (Kashem et al., 2011). Every year a huge number of goats (28%) died of pneumonia followed by PPR (27%), diarrhoea (4%), diarrhoea and pneumonia (14%), anthrax and pneumonia (7%), anthrax and diarrhea (2%), PPR, diarrhea and pneumonia (6%). Mortality due to PPR is the second most causal agent in the surveyed location. PPR (25%), pneumonia (21.15%), diarrhoea (17.31%), and predator invasion (23.08%) are the leading causes of paediatric mortality (Kashem et al., 2011). The main obstacle to goat production in rural areas is said to be the high child mortality rate. However, in semi-intensive and intensive systems of commercial goat farming, the main causes of kid mortality are infectious (63%) followed by predators (10%), mechanical (4%), and congenital (1%), and among infectious causes, the prevalence of different diseases is diarrhoea, pneumonia, bloat and enterotoxaemia, ecthyma and others like 30%, 27%, 23%, 17%, and 2%, respectively (Ershaduzzaman et al., 2007). Among 100

Socio-economic importance and rearing system of goat

farmers 96% used medicine for the treatment of disease of goats in that area. Similarly, 73% of farmers administered vaccines to goats whereas 27% did not practice vaccination. The most common vaccination was PPR that was practiced by 87.67 % of farmers but only 12.32% administered others vaccine. About 92% of farmers practiced de-worming of goats. The study's findings are comparable to those of Begum *et al.* (2007) found that 83.3% of

farmers employed vaccinations, 80% de-wormed their livestock, and 45% separated sick animals from healthy livestock. The goats which were died from infectious diseases were disposed of by burial method (96%) where the dead carcass was covered with soil in the open field or roadside. Only 1% of the dead carcass was thrown in the river flow and 3% in the open places.

Table 4. Feeding and drinking system of goats

Parameters	Category	Respondents (n=100)	Percentage
Feed source	Green grass	70	70
	Green with straw	11	11
	Green and concentrate	19	19
Water source	Tube well	45	45
	Pond	47	47
	Supply water	8	8
Fodder cultivation	Napier Pakchong	43	43
	German	22	22
	No cultivation	35	35
Rainy day feeding	Tree leave	58	58
	Green grass	18	18
	Leaves with concentrate	21	21
Feed technology	Others	3	3
	UMS	7	7
	UMB	1	1
Use of feeder	No tech.	92	92
	Yes	24	24
	No	76	76
Regular cleaning of feeder and drinker	Yes	17	17
	No	83	83
Fattening by steroid	Yes	1	1
	No	99	99

UMS = Urea Molasses Treated Straw; UMB = Urea Molasses Block

Table 5. Disease prevalence, vaccination, treatment and de-worming of goats

Parameters	Category	Respondents (n=100)	Percentage
Common disease	Anthrax	6	6
	PPR	24	24
	Diarrhea	11	11
	Pneumonia	59	59
Reason for mortality	Anthrax	12	12
	PPR	27	27
	Diarrhea	4	4
	Pneumonia	28	28
	Diarrhea pneumonia	14	14
	Anthrax pneumonia	7	7
	Anthrax and diarrhea	2	2
Treatment	PPR and diarrhea pneumonia	6	6
	Yes	96	96
Vaccination	No	4	4
	Yes	73	73
PPR vaccination among vaccines	No	27	27
	Yes	64	87.67
De-worming	No	9	12.32
	Yes	92	92
Disposal	No	8	8
	Burry in soil	96	96
	Open place	3	3

Conclusion

The majority of farmers followed a semi-intensive approach to raising goats and they slept in goat houses at night. Farmers preferred to raise bucks and doe for additional family income. Although some farmers gave their goats concentrate, the primary food sources for goats were green grass, tree leaves and Napier Pakchong fodder. Most of the farmers followed natural breeding method. There were more pneumonia and PPR illnesses. However, the majority of goat producers used a PPR vaccine and de-wormed their animals. The farmer should pay attention on good husbandry practices such as ventilation, housing, nutrition as well as disease prevention measures particularly on pneumonia that will minimize kid mortality. As many farmers lead their livelihood by rearing goat in this area, it may be arranged training session on goat husbandry for the farmers by Department of Livestock Service or other organization.

Author's contribution

The study was conceptualized and designed by T Chanda, A Rahman and MA Ali. Data collection and analysis were carried out by A Rahman, MA Ali, MT Hasan, and MAH Sarkar. MA Ali and A Rahman drafted the manuscript. The manuscript was reviewed, revised, edited and then approved by MA Islam, MAH Sarkar, NG Saha and T Chanda. Fund and research allocation were provided by T Chanda.

Conflict of Interest

Regarding this article, there is no conflict of interest.

Data availability

The data of the research are available from the corresponding author upon logical request.

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Ethical approval

Not applicable

Consent of participate

Not applicable

Consent for publication

Not applicable

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Socio-economic importance and rearing system of goat

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