



Prospects and problems of quail farming at Jhenaidah Sadar Upazila, Bangladesh

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ABSTRACT

This study aimed to assess the status of quail production, its problems, and prospects in Jhenaidah Sadar Upazila. The present study was conducted at 10 randomly selected quail farms under Jhenaidah Sadar Upazila, Jhenaidah from 20 November 2019 to 20 May 2020. Data were gathered using a structured questionnaire through face-to-face interviews and observation and analyzed using Microsoft Excel 2019. The results showed that 80% of the quail farmers were male and 20% were female. In this study, 80% of the quail farmers used quail farming as their primary source of income generation who belonged to the age group between 20-40 years old. The purpose/pattern of quail farming was categorized as Layer and hatching, Meat production, and Mixed of both. Around 30% of the farmers reared quail for egg production and hatching, 10% of farmers reared for meat, and others (70%) raised it for both purposes. 60% of farmers were medium-scale producers with a flock size of 500-1000 birds. The rearing system was floor type (100%) and the feed was crumble type (80%). This study found that most of the farmers kept male and female quails together in the same pen at an average male-to-female ratio of 1:3 for producing fertilized eggs. Mainly two marketing channels (wholesalers/retailers and both types) were available for quail farming in Jhenaidah Sadar Upazila. The study also showed that 60% of farmers cleaned their farms and 40% had maintained vaccination schedules regularly. The causes of mortality of quails were recorded due to diseases (35%) and poor management (65%). All observed farm owners reared Japanese quail for their better production and adaptability. By taking soft loans from Govt. and various NGOs in Jhenaidah Sadar, most of the people are running their quail farms. But the quail industry was not yet popular like the chicken industry and the following problems were identified: poor marketing channels, subsistence farming, lack of specialized feed, lack of available day-old chicks, high chick mortality, etc. Scientific feeding, training the farmers about their management, and creating an organized marketing channel will be the probable solution for vitalizing this species in Bangladesh.

INTRODUCTION

Bangladesh is an agriculture-based developing country with approximately 140 million poultry which plays a vital role for income generation and nutritional fulfillment in Bangladesh. Approximately 25% of the protein consumed in Bangladesh originates from poultry. In 2022-2023, total meat production in Bangladesh was 8.71 million metric tons (Saleque, 2023). In Bangladesh, it has been determined that poultry meat production accounts for 37% of the total meat production, and poultry contributes approximately 22-27% of the overall animal

protein supply in the country (Hamid et al., 2017). As protein intake is recommended to be in the range of 0.8 to 1.6 g/day per kg body weight for humans (Heck et al., 2010), this requires 56 to 112g protein per day for a person of 70 kg body weight. Thus, there is a need to increase animal protein production to fulfill the demand of the people. To meet the requirement, the majority of this poultry is indigenous chickens and ducks but their productive performance is low and causes economic losses due to diseases and predators. Exotic pure breeds did not perform satisfactorily in the scavenging system because of their higher nutritional demand and lower disease resistance

(Akarikiya, 2022). Therefore, in addition to indigenous poultry, rural and semi-urban people need a suitable species of bird that can be reared easily with little investment and provide more economic return within a very short time (Redoy et al., 2017).

Quail is one of the important poultry species and quail farming is regarded as a great source of employment (Nasar et al., 2016), and livelihood for small-holding farmers and women in Bangladesh. Additionally, it is considered an important source for the provision of meat and eggs in Bangladesh. Quail meat contains more protein than chicken (Ioniță et al., 2010). Quail having carcasses made up of 76% of meat, 14% of skin, and 10% of bone, has the highest amount of meat and the least bone ratio among the other poultry products (Gecgel et al., 2015). With high protein, essential fatty acids, and minerals such as sodium, potassium, and iron, quail meat has become familiar to people at least to some extent. Two species of quails are suitable for breeding, viz., the Japanese quail (*Coturnix coturnix japonica*) and the American or common quail (*Coturnix coturnix*). Japanese quails belong to the *Phasianidae* family having immense potentiality, and therefore, used in commercial production for meat and eggs (Rahman et al., 2016). Japanese quail has several breeds and varieties of which Pharaoh (wild type), British Range, English White, Manchurian Golden, and Tuxedo are the most popular. In Bangladesh, only wild color and brown color strains are commercially available. Japanese quail birds mature in about 6 weeks and are usually in full egg production at 50 days of age (Krishna et al., 2016).

Although quail was introduced in Bangladesh in 1990, quail farming is still at a very limited level due to a lack of proper awareness among the masses. It has attained economic value as a commercially farmable species producing better meat with unique flavor, low maintenance cost associated with its small body size (80-125 g) coupled with its short generation interval (3-4 generations per year), the resistance of diseases, require limited land areas have added interest to farmers to start quail farming. Very few studies have been conducted on quail farmers but there is a lack of information on the perception, socio-

economic status, requirements, challenges, and prospects of quail farming in Jhenaidah Sadar Upazila concerning the overall prospect of Bangladesh. Considering these facts, the present study was conducted to understand the prospects, challenges, and requirements of quail farming.

MATERIALS AND METHODS

Study area

The study was carried out at 10 quail farms, chosen randomly, within Jhenaidah Sadar Upazila in Jhenaidah. The study areas were selected based on the availability of birds.

Time of study

This study was performed from 20 November 2019 to 20 May 2020.

Data collection

During the study period, we visited the farm, and farm-level data regarding demographic information of the owners, farm management, marketing issues, breed, vaccination status, biosecurity, and mortality were recorded using a pre-tested structured questionnaire through face-to-face interviews and observation. Moreover, additional data such as feed cost, price of quail at different ages, price of egg, problems and prospects of quail farming, etc. were collected from the quail meat and egg sellers.

Data analysis

After collecting all the necessary information, the data were sorted, coded, and recorded into an Excel spreadsheet (Microsoft Excel Version, 2019) for further analysis.

RESULTS AND DISCUSSION

Demographic profile of the quail farmers

Gender, Age, and Occupation

In the present study, 80% of the quail farmers were male and 20% were female. Nasar et al. (2016) surveyed 14 districts in Bangladesh and reported that around 86.5% of the quail farms are

operated by male farmers which also coincides with the findings in selected areas of Benin Republic and Ghana (Ekpo et al., 2020; Akarikiya, 2022). Although quail farming is the most promising enterprise besides broiler and layer farming, females are found to be reluctant in our country which may be due to the farm practices alongside household activities. Management practices in quail farming are more practical and restricted compared to the deshi chicken and duck rearing.

However, the age of 60% of farmers was above 40 years old, 30% of farmers were between 20-40 years and 10% of farmers were less than 20 years old. Considering the primary occupation, 20% of quail farmers were jobholders and 80% of them were jobless. The 20% of quail farmers (Job holders) belonged to the age group over 40 years old. Thus, quail farming is a means of passing their leisure time and also a secondary source of income generation. On the other hand, the jobless people (80% of the quail farmers) used quail farming as their primary source of income generation who belonged to the age group between 20-40 years old. And the rest 10% of the farmers in the less than 10 years age group, used quail farming as their hobby and an extra source of income (Table 1). Similarly, 58% people of in 14 districts in Bangladesh reared quail as a primary source of income (Nasar et al., 2016), and 66.7% of people below 40 years of age were related to quail rearing in Ghana (Akarikiya, 2022).

Education, Experience, and Training

In Table 1, the educational qualification of the quail farmers was categorized into three groups namely, undergraduate, graduate, and illiterate. Almost 80% of the farmers were undergraduates but qualified with primary education, 10% of the farmers were graduates, and 10% of the farmers were illiterate. So, 90% of the quail farmers were considered qualified in quail farming in the present study. Similar to the present study, Islam et al. (2018) reported almost 60% and 26.7% of farmers were qualified with SSC and HSC respectively in Chattogram district. Therefore, they were considered educated quail farmers.

However, 70% of the farmers were trained and 30% of the farmers were untrained whereas 60% of the farmers were previously experienced with quail farming but 40% were inexperienced. Nasar et al. (2016) and Islam et al. (2018) reported that approximately 67.3% and 26.7% of the quail farmers did not receive any training from any organization in selected districts in Bangladesh whereas 92.3% of farmers were inexperienced in quail farming in Chattogram district.

The profit generation trend showed that the higher the educational qualification with proper training and experience, gained more profit from quail farming. Additionally, the authors reported that profit from quail farming is proportional to education, training, and experience (Nasar et al., 2016; Islam et al., 2018).

Table 1: Socio-economic status of quail farmers

Traits	Parameters	Number of Farms	Frequency (%)
Gender	Male	8	80
	Female	2	20
Age	<20	1	10
	20-40	3	30
	>40	6	60
Education	Undergraduate	8	80
	Graduate	1	10
	Illiterate	1	10
Occupation	Job holder	2	20
	Jobless	8	80
Training	Yes	7	70
	No	3	30
Experience	Yes	6	60
	No	4	40
Purpose	Egg production and hatching	3	30
	Meat production	1	10
	Both	7	70

Purpose/pattern of quail farming

In the present study, the purpose/pattern of quail farming was categorized as layer and hatching, meat production, and mixed laying and meat production. Around 30% of the farmers raised quail for egg production and hatching, 10% of the

farmers reared for meat production and the rest of them (70%) raised quail for both purposes (Table 1).

Similar to the present study, the quail farmers in 14 districts of Bangladesh reared quail for laying (21.1%), meat production (9.6%), and mixed type (63.4%) which indicates that mixed type quail farming is very popular in Bangladesh (Nasar et al., 2016). However, the majority of the farmers select quail for laying purposes initially and after the laying period when birds are aged enough cull them for meat purposes.

Management practices for quail farming

Rearing system

The rearing system is floor type 100% in our study area where rice husk and sawdust were used as litter material in 50% and 40% of farms respectively (Table 2). On the other hand, in Ghana, 88.3% of the quail farmers use the battery cage system of housing because the management of quails is simpler under the cage system, dust, and ammonia gas accumulation is minimal, egg collection is simpler, feed wastage is decreased, and feed utilization efficiency is raised (Premavalli et al., 2015; Akarikiya, 2022).

Farm size

Table 2 shows that most of the quail farmers (60%) are medium-scale producers with a flock size of 500-1000 birds and 30% are small farms (<500 birds) in this study. In another study, most of the farmers of the other 14 districts had <5000 birds with 2-3 varieties (Nasar et al, 2016).

Feed types

Among the observed farms pellet feed is used in 10% of farms, Crumble feed is used in 80% of farms, and in many farms, the type of feed varies with stages of growth (Table 2).

Feed intake per day

The farmers gave an average concept about the amount of feed intake per day where 15-17 gm feed is supplied per bird in 30% of farms, in 50% of farms 18-20 gm feed is supplied and in 20% of farms 21-23 gm feed is supplied (Table 2). Priti and Satish (2014) stated that a five-week-old quail consumes about 500 gm of feed, which means the average feed intake is 14.29 gm per day. At the age of six months, quail consumes around 30-35 gm of feed per day.

Table 2: Feeding and mmanagement practice in quail farms of the study area

Traits	Parameters	Number of Farms	Frequency (%)
House type	Floor	10	100
	Cage	0	00
Farm size	Small (<500 birds)	3	30
	Medium (500-1000 birds)	6	60
	Large (>1000 birds)	1	10
Litter materials	Rice husk	5	50
	Saw dust	4	40
	Others	1	10
Type of feed	Pellet	1	10
	Crumble	8	80
	Both	1	10
Feed intake/bird/day	15-17 gm	3	30
	18-20 gm	5	50
	21-23 gm	2	20
Male female ratio	1:2.5	2	20
	1:3	4	40
	1:3.5	4	40
Marketing channel	Wholesaler	3	30
	Retailer	2	20
	Both	5	50

Male Female ratio

In 40% of farms, the male and female ratio is 1:3 and 1:3.5 respectively, whereas 20% of farmers keep the ratio at 1:2.5 (Table 2). A survey revealed that 70% of the farmers kept male and female quails together in the same pen at an average male to female quail ratio of 1:3 to produce fertilized eggs only (Akarikiya, 2022).

To improve the genetic makeup of the quails kept in cages, stocking ratios of male to female should be 1:2, and up to 1:5 are preferable (Narinc et al., 2013; Priti and Satish, 2014).

Marketing channel

Mainly two marketing channels are available for quail farming in Jhenaidah Sadar Upazila and the channels are used for both layer and meat purposes. In this study, 30% of farmers deal with wholesalers, 20% with retailers, and 50% with both types (Table 2). In comparison to chicken, the market range of quail is quite limited. Chicken items can be sold all over Bangladesh. However, quail products are extremely limited. Although quail eggs are popular in some areas, quail meat is not widely consumed in Bangladesh. According to a prior study, the limited market range for quail farming discourages farmers from raising quails (Siddique et al., 1996).

Vaccination status

In the present study, farmers had maintained vaccination schedules regularly at 40% and

irregularly at 60% on their quail farm (Figure 1). There are no medications approved for quail, and also are no disease-preventive vaccines (Dozier et al., 2010). So, in this study, we found that the farmers are using the Ranikhet Disease Vaccine of poultry supplied by the Upazila Livestock Office and Veterinary Hospital, Jhenaidah Sadar.

Consultancy with veterinarian

In this present study, there are 70% of farmers had no health consultation with veterinarians for the treatment of diseases of quail. Only 30% of farmers maintain veterinarian consultation (Figure 1). Nasar et al. (2016) stated that only 52% of farmers took veterinary care or advice in case of diseased conditions of birds.

Biosecurity

Nasar et al. (2016) reported that most of the farmers (73.0%) in their study area were well concerned about the general practice of biosecurity measures. Another study in Ghana stated that biosecurity protocols are maintained in 21.6% of quail farms (Akarikiya, 2022). In this study, among the 10 selected quail farms, 60% of farmers regularly cleaned their farms, and 40% of farmers did not maintain cleaning practices in their quail farms (Figure 1). Faruque et al. (2023) reported that the drinkers were cleaned daily, and the feeders were cleaned twice a week while measuring refusal feeds every morning to prevent disease outbreaks.

Table 3: Information related to marketing of quail in the study area

Traits	Parameters	Range	Average
Marketing age of birds	Male	29-35 days	32 days
	Female	30-34 days	32 days
Live weight of birds	Male	130-150 gm	140 gm
	Female	105-110 gm	107.5 gm
Price of bird	125 gm/bird	35-45 taka	40 taka
Egg production per day	1000 female birds	850-900	875 pieces
Price of eggs	Per egg	2.3-2.7 taka	2.5 taka
Price of day-old chick	Per birds	6-7	6.5 taka

Cause of mortality

The causes of mortality of birds were 35% due to diseases and 65% due to poor management issues in the present study (Figure 1). Compared to chickens, Japanese quails are more resistant to diseases like enteric diarrhea, pneumonia, infectious coryza, salmonellosis, coccidiosis, etc. (Rahman et al., 2016). Quails are more susceptible to poor management than chicken. To prevent and control diseases, good management procedures are crucial (Ferket, 2007). That is why the mortality of quail due to diseases is comparatively less than the management issue.

Table 3 shows that the average marketing age of quail is 32 days for both male and female birds. In another study, the average marketing age of these birds was 30 days (Nasar et al., 2016).

In this study, the average live weight of a male bird is 140 gm and the female bird is 107.5 gm (Table 3). In another study, experimentally, the highest live weight was 162.5 gm/quail and the average live weight was 145.8 gm/bird in Bangladesh with different dietary nutrient supply (Sultana et al., 2007). The price of adult birds, eggs, and day-old chicks varies with the price of feeds and depends on the demand for products natural calamities, etc.

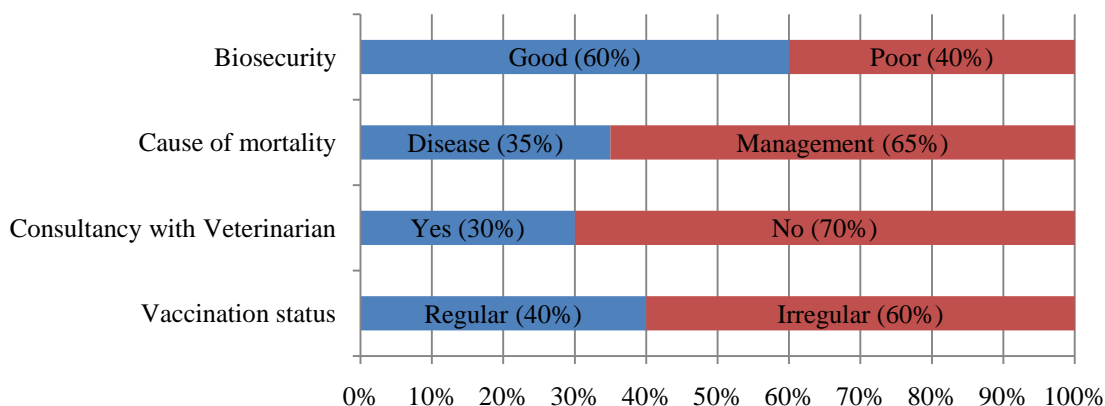


Figure 1: Bio-security, cause of mortality, vet consultancy, and vaccination status

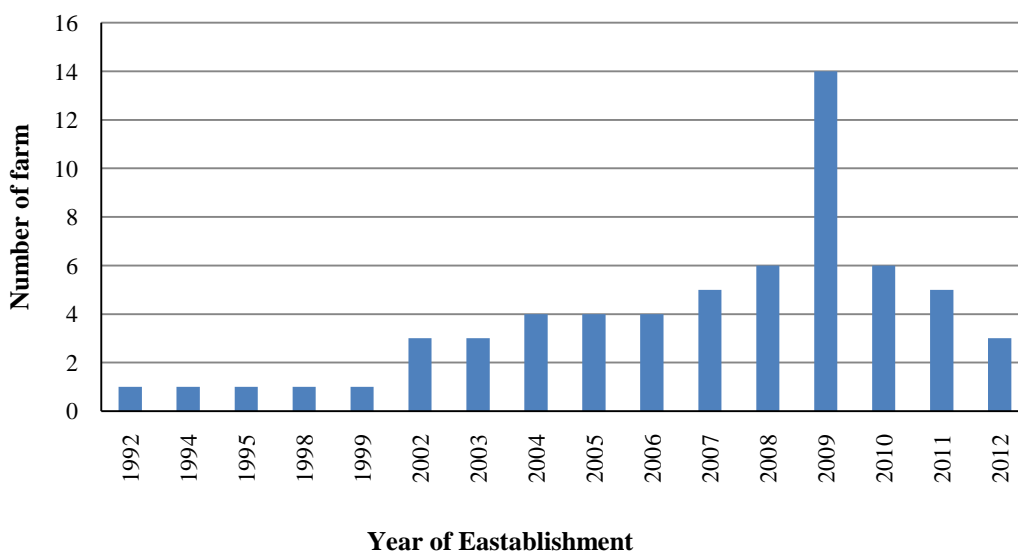


Figure 2: Establishment of quail farms in Bangladesh during the period from 1992 to 2012

Breed of quail

Only Bobwhite quail (*Colinus virginianus*) and Japanese quail (*Coturnix coturnix japonica*) have been domesticated for commercial purposes. There are several breeds and varieties of Japanese quail. Pharaoh (wild type), British Range, English White, Manchurian Golden, and Tuxedo are the most common. Pharaoh is widely raised all over the world among them (Arya, et al., 2018). In this study, all observed farm owners rear Japanese quail due to their better production and adaptability. Japanese quails have many desirable characteristics, including faster growth, early sexual maturity, a high rate of egg production (300 eggs/year), a short generation interval (3-4 generations/year), a small floor space (200-250 and 150-200 cm², respectively in litter and cage systems), lower feed requirements (20-25 g/adult bird/day), a short incubation period of hatching eggs, lower feed cost, and less susceptibility to common chicken diseases (Nasar et al., 2016). That is the reason for rearing Japanese quails all over Bangladesh.

Prospects of quail farming in Jhenaidah Sadar Upazila in Bangladesh

Quail farming in Bangladesh was started in 1992 and remained static for about one decade (1992-2003) since its inception, after that, gradually increased till 2009 (highest in 2009) and gradually declined after that (Figure 2) (Nasar et al., 2016). The reasons might be outbreaks of epidemics, faulty management systems, higher prices of feeds, the higher incidence of different infectious diseases, and lack of veterinary care. (Siddique et al., 1996; Das et al., 2008; Rahman et al. 2010). The majority of the farmers in Bangladesh have practiced mixed-type quail farming. Rahman et al. (2016) reported that layer, parent stock, and broiler or meat-type quail were only reared by 21.1%, 3.8%, and 9.6% of farmers, respectively. Mixed-type quail farming is practiced worldwide because Japanese quails are suited for commercial rearing for egg and meat production under intensive management (Shamsuddoha et al., 2005; Egbeyaleet al., 2013). This is because of their hardiness and ability to thrive in small cages (Odunsiet et al., 2023); the relatively short

generation interval, and the cheaper cost of production.

Quail bird farming is five times better than chicken and turkey rearing, and a person with 400-layer quail birds is better off than a person with 2000 laying chickens. Many people are interested in rear quail on a commercial basis due to lower initial investment and risk rather than commercial broiler farming (Islam et al., 2014). Meat-type quails are more popular than egg-type quail production in Bangladesh (Rahman et al., 2010). The demand for commercial quail production is increasing day by day in the country (Islam et al., 2014).

The geographical location and environmental condition of Jhenaidah are very good and quail farming is suitable for a successful program. Most people are poor with a poor lifestyle. To fulfill the nutritional deficiency, especially the protein demand of people is very necessary for their health and improves the body's immunity. Unemployed people favor the establishment of quail farms on a large scale in this area. Due to fewer worker requirements with little investment to start quail farming nowadays women or housewives are getting involved in quail farming to overcome their poverty. Therefore, this huge time most of the men and women are without work. By taking soft loans from Govt. and various NGOs in Jhenaidah Sadar, most of the people are running quail farms successfully. Quail meat is more tasty than chicken and has a low-fat content. It promotes body and brain development in young ones. As a result, both poverty and malnutrition problems will be reduced easily.

Problems of quail farming in Jhenaidah Sadar Upazila in Bangladesh

In the poultry world, quail meat and egg production are negligible when compared to broilers and layer chicken. Besides, the sector does not seem to be experiencing any substantial and sustained growth, despite the attractive marketing features of the meat. In Bangladesh, quail is not yet popular because of some unique characteristics such as being sensitive birds, the cannibalism rate being very high; management is uncommon at the

farmer level, high chick mortality, egg production peculiarity, and low body and egg weight.

Higher lighting requirement than chicken: If the day gets shorter, they stop laying. They like all birds, are daylight sensitive, when the daylight gets too short, they reduce or stop laying.

Very sensitive to different protein levels than other poultry species: They are also very sensitive to protein. If the protein contents in the supplied feed are lower, they reduce their egg production without showing any symptoms. Quail birds are very sensitive to high salt levels in their feeds. The optimum level of this mineral should be kept at 7% and in no case, be more than 7% (Nance, 1965).

Quail chicks are more sensitive to temperature than chicken: When the temperature rises above 28°C, the production and quality of eggs decreases. Higher cannibalism rate than other poultry species: Many forms of cannibalism occur in quail raised in captivity. Cannibalism comprises vent pecking, feather pecking, toe pecking, head pecking, and nose pecking.

Higher chick mortality: The chicks are very small in size ranging from 8- 10g, and the mortality is very high. In extreme conditions, the chick mortality will be 100%.

Problems of raising quail chicks: Quails never incubate their eggs. So, we can produce chicks by hatching their eggs through chickens or artificially by using incubators. The incubation period for quail eggs is about 16 to 18 days. For maximum egg production, 16- 16.5 hours of lighting period is required daily inside the quail house. Keep newly born quail chicks in a brooder house. Chicks need an artificial heat and temperature management system for 14 to 21 days from their birth.

Low market range: The market range of quail is very limited compared to chicken. Chicken products can be marketed all over Bangladesh but in the case of quail, it is very much limited. Quail egg has some popularity in several regions, but meat is not yet popularized in Bangladesh. So, because of the narrower market range, farmers are

not interested in quail farming (Siddique et al., 1996).

Lack of transport facilities: The transport facility of Jhenaidah is good but the local market is not satisfactory yet. Farmers need to sell their quail and eggs far from their farm place which is enough to dishearten them.

Low-quality chick: No established and trustworthy professional quail hatchery is available in Jhenaidah. Local breeders generally just buy the chicks from distant places in Bangladesh like Bogra and Rangpur. As a result, the farm owners are deprived of having good and healthy chicks. Many chicks die within a few days due to transport stress and poor management and some others die in their early stage of life.

Lack of knowledge: Most of the farm owners are illiterate and they lack knowledge about farm management. As a result, the quail does not grow at the optimum rate. Lack of proper knowledge of feeding, space requirements, lighting, etc. plays a negative role in getting the expected profit in the end.

Higher feed cost: Quail feed is quite high in the country. As the farmers are now aware of the importance of a balanced ration, they are going for formulated ration from the feed companies. They do not think about making their feed by themselves which makes them dependent on the feed companies. Moreover, with the current unstable situation in the country and the overall price hike of necessary things, poultry feed prices have increased too.

Lack of Govt. influence: The Govt. does not take care of the remote area and is about making young unemployed people interested in quail farming. People do not get help from the Govt. on broiler farming in this area. So, this area is lagging in this sector.

CONCLUSION

Quail farming has now created a sound acceptance across the nation in both rural and urban areas. The majority of farmers in Bangladesh are actively engaged in mixed-type quail farming. Many

individuals are engaged in rearing quail on a commercial basis due to lower initial investment and risk, as opposed to commercial broiler farming. Meat-type quails are more popular for production than egg-type quails in Bangladesh. The demand for commercial quail production is increasing in the country. The factors that are discussed in the study, influence quail range, farming management, and disease control which help to emphasize the social factors, management practices, nutritive and medicinal value having access to the market. These practices benefit quail farmers by providing food, income, and employment opportunities in multiple ways. One of the major issues in the quail farming industry is the lack of organized propaganda. Proper management of quail chicks can help address this problem. The quail-based poultry sector in Bangladesh requires more research to improve the control and prevention of severe symptoms. Current policies need to be reviewed as they may be outdated or unexplored. This study aims to strengthen the industry and develop research pathways for the production, management, maintenance, and marketing of quail issues. Moreover, a government-led mass media campaign can solve many issues in quail farming. The following recommendations may be considered to sustain the quail farming of the country: -

To mitigate the food deficit, especially protein-related food, the quail farming sector needs special attention for which Public and private collaboration is essential.

Supply chain management should be improved so that the poor farmers can directly supply to the retail shops and middlemen cannot suck the profit.

COMPETING INTEREST

The authors declare that they have no competing interests

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