

Quail Farming and its Problems and Prospects in Satkania, Chittagong



A Report

By

Muntachir Bin Noman

Roll No: 11/ 40

Reg. No: 00690

Intern ID: 56

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**Quail Farming and its Problems and Prospects in Satkania,
Chittagong**



Approved as to style and content by

(Signature of Supervisor)

Prof. Dr. M. A. Hossain

Professor

Department of Dairy and Poultry Science

Faculty of Veterinary Medicine

Chittagong Veterinary and Animal Sciences University

Khulshi, Chittagong, Bangladesh

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Abstract

The study was undertaken to identify the problems and prospects of quail farming in Satkania Upazilla and Patiya Upazilla, Chattogram, Bangladesh. Required data were collected from the quail farms, farmers of Satkania and Patiya. Both broiler and layer quail farming were found profitable after economic analysis. The data showed that TK 4.78 profit per broiler quail per batch was earned against TK 4083.00 per layer bird per year, and it implies that layer quail makes more profit. Lack of awareness about quail meat and egg consumption is the main hindrance for popularizing the quail farming. On the other hand, low investment requirement, short generation gap per batch and early marketing facilities etc., are attracting the farmers to go for quail farming. Quail farming business could, therefore, be suggested to adopt as a profitable enterprise.

Key words: Quail farming, Problems, Prospects, Profit

CHAPTER 1

Introduction

The common quail (*Coturni xcoturnix*) is a small migratory Galliform species like chicken. Quail domestication is believed to have started in China when a particular subspecies that commonly migrates between Europe and Asia were raised as pets and singing birds. The domesticated Coturnix was brought to Japan from China across the Korean bridge. Several interbreeding subspecies are recognized, the more important being the European quail, *Coturnix coturnix coturnix*, and the Asiatic or Japanese quail, *Coturnix coturnix japonica* and *Colinus virginianus*. There are about 131 species of wild quail found all over the world (**Siddique and Mandal, 1996**). Only Bobwhite quail and Japanese quail have been domesticated for commercial purposes. Japanese quail has several breeds and varieties of which Pharaoh (wild type), British Range, English White, Manchurian Golden, Tuxedo are most popular Among these, Pharaoh is widely raised all over the world. It has two popular color strains, wild color and brown color (**Rahman, 1995**). In Bangladesh, only these two are commercially available. Besides, scientists developed many quail lines e.g. white eggshell line, meat line etc.

Although quail was introduced in Bangladesh in 1990, quail farming is still in very limited level due to lack of proper awareness among the mass. It has attained economic value as an commercially farmable species producing better meat with unique flavours, the low maintenance cost associated with its small body size (80-125g) coupled with its short generation interval (3-4 generations per year), resistance to diseases have added interest among the farmers to start quail farming., Japanese quail also is the smallest avian species farmed for meat production (**Vali, 2008**).

Now farmers with little investment are showing more and more interest in quail farming despite all the problems in marketing quail meat and eggs. Quail can be used for game, pet and also for research purposes too. Bangladesh is a poor country, and her economy is agro-based. There is a huge demand of meat among the people. The continued rise in human population in the developing countries like Bangladesh necessitates the need to establish additional sources of animal protein like quail meat and egg (**Owen and Dike, 2013**). In Bangladesh, people are not getting optimum amount of protein where the minimum daily intake of 65 g recommended by the Food and Agricultural Organization to be the minimum requirement for the growth and development of the body (**FAO, 1999**).

Boosting the poultry industry with a short generation interval is an alternative means of alleviating the deficiency of animal protein in Bangladesh. Among the poultry species the Japanese quail (*Coturnix coturnix Japonica*) are being raised primarily for their meat and eggs. This is more profitable. (**Islam et al. 2015**). By now quail production has already been occupied a small but significant segment of the Bangladesh poultry industry. The Japanese quail have the advantage of small size, short life cycle, rapid growth rate, good reproductive potential, high fecundity rate, and shorter hatching periods when compared with the different species of poultry (**El-Katcha et al., 2015**). With high protein, essential fatty acids, and minerals such as sodium, potassium, and iron, quail meat has become familiar to the people at least in some extent. 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. Japanese quail birds mature in about 6 weeks and are usually in full eggs production in 50 day of age (**Das, 2004**).

Japanese quails have been reported to be generally resistant to common disease. The Japanese quails therefore have the potential to complement the obvious gap in the protein needs of Bangladeshis. One of the areas that need particular attention is the publicity and creating market demand of quail as it is not welcomed by all yet. Quail farming can be a very promising sector in the meat production of Bangladesh if government takes initiatives. Some other poor and developing countries are now rearing quail for economic solvency (**Harunna et al., 1997**). It will provide cash income and create employment opportunity for rural people, particularly small farmers. Young people can solve their unemployment by quail farming. A small family can run with it and earn extra income for their family due it needs a small investment and low cost. So it will help to alleviate their poverty. Quail farming not only requires minimum investment, but also few labours, limited land areas. It can be easily marketed within very short time (0-6 wks). The growth performance of Japanese quail is also better and amount of their feed intake is also very low (**Almeida et al., 2002**). Feed consumption followed similar trend to that of weight gain. Their Meat is also palatable. One of most prominent hinders in quail farm is that people are still ignorant about edibility of the quail meat and eggs (**Balarabe and Charles, 2015**). Very few studies have been conducted on the management of quail, but there is lack of information on the problems and prospects of quail farming in Bangladesh. But to popularize the quail meat among the people and to encourage the young farmers to rear quail, a thorough study is important.

Considering these, the present study was conducted with the following objectives:

- a) To review of management procedures in quail production;
- b) To examine the prospects and limitations that may be predicted in quail production in Bangladesh.
- c) Suggestions were made to improve quail production and useful recommendations were made in order to make the quail meat and eggs accepted by the general mass.

CHAPTER 2

Materials and Methods

2.1 Study area:

The study was conducted at local markets of Satkania, Chattogram. and a local quail farm & hatchery known as Khaja Quail Farm & Hatchery Limited, Potia, Chittagong. It has got three rearing units and a brooding shed. A total of 650 broiler along with 700 more 3 days old chicks were in this small farm during this study.

2.2 Site selection

The study areas were selected on the basis of availability of birds and as part of my internship program .

3.2 Management related requirements of a quail farm.

For commercial quail farming, housing system should be of cage system. However, at Khaja Quail Farm the housing system was litter type.

3.2.1 Floor space:

The floor management for rearing broiler was 51 feet long and 16 feet wide. Day old chicks up to 3 weeks 100 sq. cm./bird and from 3 weeks up to 6 weeks (marketing age) 170 sq. cm./bird floor space were given.

3.2.2 Litter materials:

Wood shaving was used as litter materials at the depth of 7 cm over the floor. The litter material management was good.

3.2.3 Incubation and hatching:

The incubation period for quail is 17-18 days, depending on the strain and the incubation procedures. Successful hatches depend upon a good understanding of incubator controls. A still-air incubator was used. The normal incubation temperature was 38.3°C. Humidity was less than 70%. The eggs were turned by hand at least three, and preferably five, times a day. The eggs were hatched at 17th to 18th day of incubation.

3.2.4 Brooding:

The chicks were kept within a case. Papers were used as litter and papers were changed every day. 95°F temperature was maintained 24 hrs. daily as brooding temperature from the day of hatching up to 2 wks.

3.2.5 Lighting management:

During brooding period (0-2 wks) 24 hours lighting should be ensured. After the brooding period (0-2 wks), lighting program depends on the purpose of production. If birds are reared for meat production, they can be given 23 hours lighting and 1 hour darken.

3.2.6 Temperature schedule:

During brooding period (0-2 wks), 95°F temperature and from 3 wks to marketing age (6 wks) 75°F temperature is recommended.

3.2.7 Feeder and drinkers

Adult quail need 1.25-2.5 cm of feeder space per bird. Ample feed should be present, but if the trough is too full, excessive wastage will occur. Clean, fresh water should be provided at all times with a minimum of 0.6 cm of trough space per quail. Nipple drinkers and cups are suitable for adult quail. One nipple or cup should be provided for every 5 birds.

3.2.8 Feeding and nutrition:

The birds were supplied controlled balanced pellet feed. The chicks were supplied 2 gm feed per bird daily on avg. in (0-2) wks. The birds were supplied 18.75 gm per bird daily on avg. from 3 wks to the marketing age (6 wks). They would supply ready mixed feed from market. The ME of starter (0-2 wks) and finisher feed (3-6 wks) was 3000 and 3050 Kcal/kg, respectively (They use Provita feed) which are lower than the standard ME requirement. Likewise, the supplied CP in the starter feed was 22% and in the finisher it was decreased to 20% which are also lower than the standard CP% (25% & 20.5% respectively). But the Ca% & P% of supplied feed was slightly higher than the standard levels.

3.2.9 Diseases, treatment and vaccination:

Quails are reported to be more resistant to the diseases than other poultry species. In the studied quail farm, only enteritis was reported as the farmer reported. Though coccidiosis, egg drop syndrome, lice infestation are also seen (**Chapman, 2014; Adamu, 2015**). Overall mortality of the farm was recorded as 5%. Mortality rate is higher at the first two weeks of age when the chicks need special care with more temperature.

3.3 Data collection:

I visited the farm and collected the data by own observation & interviewing the owner Abu Sadek of respective farm from from 25th April 2018 to 30th April 2018. Moreover, numerous data were collected by contacting owner over phone and by visiting some quail meat and egg sellers near Pahartoli. Following data were collected during the study:

1. Housing system, housing and infrastructure cost
2. Feed intake and feed cost
3. Body weight gain
5. Disease prevalence and mortality
6. Feed cost
7. Price of each quail sold at
8. Price of chick of different ages to buy
9. Price of an egg
10. Problems in quail farming as well as in marketing.

3.4 Data Analysis:

Data related to the net profit estimation, problems and prospects of quail farming according to the quail farmer were collected and compiled and numeric data were analyzed using Microsoft Excel 2013.

CHAPTER 3

Results and Discussions

From the survey it was noted that, the farmers hatched their eggs by setting into the incubator.

And the hatchability of chicks was calculated by the following formula:

$$\text{Hatchability (\%)} = \frac{\text{Total number of chicks hatched out}}{\text{Total number of egg set into incubator}} \times 100$$

Total number of fertile eggs set in setter (in the studied) was 910. A total of were 650 chicks were hatched on 18th day of incubation. So, the hatchability (Total no. of chicks hatched / Total no. of fertile eggs settled) $\times 100 = 71.42\%$. The storage of quail eggs at tropical temperatures seems to be suitable up to 6 days when hatchability is 70 %, which agrees with findings of **(Daikwo et al., 2011)**. After one week of storage there was an increasing rate of unhatched eggs, mainly because of pre-incubation mortality or early embryonic death. It was also observed that the storage length influenced the rates of egg mass loss during incubation and the hatching time **(Romao et al, 2010)**.

4.2 Problems of broiler farming in Chittagong

The farmers and the quail egg and meat sellers have mentioned following problems in rearing quail in Chittagong.

1. Lack of awareness :

The fact that there is another poultry species with good taste, nutritious eggs is unknown to a large number of people **(Balarabe and Charles, 2015)**.

Frequency distribution of the persons questioned randomly by the level of their awareness was found frustrating during my field study which means a lot why quail farmers are facing problem to market their eggs and quail meat.

Moreover, farmers are not convinced yet to install quail farms due to unstable and disappointing market demand.

2.0 Lack of transport facilities:

A transport facility of Poitya is good but 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.

2. Lack of electricity:

Electricity is the prerequisite to make broiler and layer quail farm. Without electricity it is almost impossible to manage a quail farm from first to last. But in Potiya Upazilla as well as everywhere in Bangladesh load-shedding is very frequent. So, farmers from remote places cannot even think of quail farming due to lack of electricity.

3. Non-attractive color of quail egg:

Quail egg is colored and pigmented which makes them ugly and people at their first sight feel no further interest in buying it. Of course, days are changing, but still egg selling is a quite difficult tasks as they people are not convinced.

4. Necessity of incubator to hatch the eggs:

Quails do not hatch their own eggs easily. And those who plan for producing chick at their own farm for more profit are compelled to buy incubator. Incubators are costly and farmers finds it difficult.

5. Low quality chick:

No established and trust-worthy professional quail hatchery is available in Chittagong. Local breeders are generally just buy the chicks from distant places of Bangladesh like Bogra and Rangpur. As a result the farm owners are deprived from having good and

healthy chicks. Many chicks die within few days due to transport stress and poor management and some other die in their early stage of life.

6. Lack of knowledge:

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

7. Higher feed cost:

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

8. Lack of Govt. influence:

The Govt. does not take care of the remote area and about making young unemployed people interested in quail farming. People do not get the help of the Govt. on broiler farming in this area. So this area is lag behind in this sector.

4.3 Prospects of broiler farming in Chittagong city:

Chittagong is a large city. The geographical location, environmental condition is very good where broiler farming is suitable for successful program (**Paul and Sarker, 1992**) Most of the people are poor with lower lifestyle. To fulfill the nutritional deficiency specially protein demand of people is very necessary for their health and improve the body

immunity. Unemployed people favor the establishment of quail farm on a large scale in this area. Due to less worker requirement with little investment to start quail farming now a days the women or housewives are getting involve to quail farming to overcome their poverty. Therefore, this huge time most of the men and women are without work. By taking soft loan from Govt. and various NGO in our country, the most of the people can run quail farm successfully. As a result both poverty and malnutrition problems should be reduced easily. So, to be a self-reliant and economically solvent one, young man and women should go for quail farming as

1. Little investment is needed.
2. Feed intake is very low.
3. No special ration is needed.
4. Susceptibility to diseases is rare.
5. Generation gap 2-3 months is short.
6. The future of quail farming is very Promising due to ever increasing demand and awareness among the animal protein loving people

CONCLUSION

Quail farming has now created a sound acceptance among the young people in both rural and urban areas. In addition, farmers even who started the business with a very little investment are being profited. Considering the socio-economic status of Bangladesh and the significant profitability of quail farming as found in this study, quail farming can easily be a good means to alleviate poverty problem in some extent. Moreover, if quail farming become popular, the demand of animal protein will be met. A strong and repeated publicity and awareness making campaigns among the people by the govt. especially through mass media will solve most of the existing problems in quail farming.

6. References

- Almeida MIM, Oliveira EG, Ramos PR, Veiga N and Dias K. (2002). Growth performance of meat male quails (*Coturnix sp.*) of two lines under two nutritional environments. Archives of Veterinary Science 7, no. 2
- Adamu YA, Alayande MO, Bello A, Onu JE, Umaru MA and Sadiq YA. (2015). Lice infestation on Japanese quail (*Coturnixcoturnix japonica*) Temminck& Schlegel 1849 in Sokoto metropolis, Nigeria. Net Journal of Agricultural Science, 3(1):32-34.
- Balarabe RM and Charles E. (2015). The Prospects and Limitations of Japanese Quail (*Coturnixcoturnix japonica*) Production in Nigeria- A Review. International Journal of Multidisciplinary and Current Research.Vol.3. September/October 2015 issue.
- Chapman HD. (2014). Milestones in avian coccidiosis research: A review on Poultry
- Daikwo SI, Dim NI and Momoh MO. (2011). Hatching characteristics of Japanese quail eggs in a tropical environment. International Journal of Poultry Science, 10(11), 876-878.
- DasGB (2004). Quail management. IN: Poultry production, 1sted, Bangla Academy, Dhaka 1000, Bangladesh. p: 237-245
- Das SC, Chowdhury SD, Khatun MA, Nishibori M, Isobe N and Yoshimura Y. (2008): Poultry production profile and expected future projection in Bangladesh. World's Poultry Science Journal 64, no. 01. 99-118
- El-Katcha MI, Soltan M, Ramdan SS, Naggar E & El-Shobokshy SA. (2015). Growth Performance, Blood Biochemical Changes, Carcass Traits and Nutrient Digestibility of Growing Japanese Quail Fed on Various Dietary Protein and Calcium Levels. Alexandria Journal of Veterinary Sciences, 44(1), 38-53.
- FAO (1999). Report of the FAO. World Food Summit Conference, 11 Rome, Italy.

- Harunna ES, Musa U, Lombin JH Tat DB, Sharmaki DD, Okewale OA and Molokwu JV (1997). Introduction of quail production in Nigeria. *Nigeria Veterinary Journal*: 18:104-107.
- Islam MS, Faruque S, Khatun H and Islam NM. (2015). Comparative Production Performances of Different Types of Quail (*Coturnixcoturnix japonica*). *The Agriculturists* 12, no. 2: 151-155.
- Owen OJ and Dike UA (2013). Japanese Quail (*Coturnixcoturnix japonica*) Husbandry: A means of Increasing Animal Protein Base in Developing Countries. *Journal of Environmental Issues and Agriculture in Developing Countries*, 5(1), 1-4.
- Paul DC and Sarker NR. (1992). Quail production: a new approach in Bangladesh. *Asian Livestock (FAO)*.
- Rahman MS, Tomohiro S and Makoto M. (2007) Effects of cadmium administration on reproductive performance of Japanese quail (*Coturnix japonica*). *The Journal of Poultry Science* 44, no. 1: 92-97.
- Romao JM, Moraes TGB, Silva EE, Teixeira RSC and Cardoso WM. (2010) Incubation of Japanese quail eggs stored at tropical temperatures. *Livestock Research for Rural Development* 22, no. 1: 2.
- Siddique SA and Mandal MAS. (1996). Economics Of Japanese Quail Farming In Dhaka Metropolitan City. *Bangladesh Journal of Agricultural Economics* 19, no. 1-2.
- Vali N. (2008) The Japanese quail: A review. *International Journal Poultry Science* 7, no. 9: 925-931.

APPENDIX

Profitability analysis of quail farming

Profit estimation of broiler quail farm of 10000 birds in a batch, 4 batches per year (based on the data recorded from the farm owners)

A. Cost:

- a. Land : Own
- b. Hosing Rent: **1,00,000 taka**
- c. Day old chick cost:
Total chick 10,000 per batch at 5% mortality (4 batches in a year; $10500 \times 4 = 42,000$) at the rate of Tk. 5 per day old chick:
 $= 5 \times 42,000 = \mathbf{2,10,000\ taka}$
- d. Feed cost:
At an avg. feed intake of 0.015 kg per day per bird up to 40 days
 $= 15 \times 40 \times 42000 = 25200\ \text{kg}$ at rate of 45 Tk. Per kg of feed
 $= 25200 \times 45 = \mathbf{11,34,000\ taka}$
- e. Other cost (Electricity, medicine and accessories):
 $= 50,000 + 10000 + 20,000 = \mathbf{80,000\ taka}$
- f. Cages: 50000 taka, at 10 % depreciation cost = **5000 taka**
- g. Labor: 1 person, at 5000/month with two bonuses = **70,000 taka**

Total cost :

$(1,00,000 + 2,10,000 + 11,34,000 + 80,000 + 5000 + 70,000)\ \text{taka}$
=15,99,000 taka

B. Income:

Sold at 45 tk per bird = $45 \times 40000 = \mathbf{18,00,000\ taka}$

Net profit = $18,00,000 - 15,99,000\ \text{taka}$
= 2,01,000 taka per year.

Profit estimation of layer quail farm of 10000 birds in a batch per year:

A. Cost:

- a. Land : Own
- b. Hosing Rent: **= 1,00,000 taka**
- c. Day old chick cost:
Total chick 10,000 per batch at 5% mortality, at the rate of Tk. 35 per day old chick: $= 35 \times 10500 = \mathbf{3,67,500\ taka}$
- d. Feed cost:
At an avg. feed intake of 0.018 kg per day per bird for 365 days = $0.018 \times 365 \times 10500 = 689850 = 25200\ \text{kg}$ at rate of 45 Tk. Per kg of feed = $689850 \times 45 = \mathbf{31,04,325\ taka}$
- e. Other cost:
(Electricity, medicine and accessories)
 $= 50,000 + 10000 + 20,000 = \mathbf{80,000\ taka}$
- f. Cages: 50000 taka, at 10 % depreciation cost = **5000 taka**
- g. Incubator: 1,00,000 taka 20% depreciation cost = **20,000 taka**
- h. Labor: 2 person, at 5000/month with yearly bonus = **1,40,000 taka**
- i. Transport: **50,000 taka**

Total cost :

$$(1,00,000 + 3,67,500 + 31,04,325 + 80,000 + 5000 + 20,000 + 1,40,000 + 50,000) = \mathbf{38,66,825} \text{ taka}$$

B. Income:

- i. Egg sale: at 3 taka/egg, 250 eggs/year/bird
= $250 \times 3 \times 10000$ taka = **7500000** taka
- ii. Sold at 45 taka per bird = $45 \times 10000 = \mathbf{4,50,000}$ taka

Total income:

$$= 75,00,000 + 4,50,000 = \mathbf{79,50,000}$$

Net profit = $79,50,000 - 38,66,825$ taka

$$= \mathbf{40,83,175} \text{ taka per year.}$$

Cost Effectiveness Per Bird Rearing:

Table 1: Cost effectiveness of per broiler bird rearing

| Traits | Amount |
|--|---------------|
| Total birds (pcs) | 40,000 |
| Total cost in a year (taka) | 15,99,000 |
| Cost per bird (tk) | 40.225 |
| Total income in a year (tk) | 18,00,000 |
| Gross income per bird (tk) | 45 |
| Profit from per bird (tk) | 4.775 |
| Cost effectiveness (cost per bird/profit per bird) | 8.4 |

Table 2: Cost effectiveness per layer bird rearing

| Traits | Amount |
|--|---------------|
| Total birds (pcs) | 10000 |
| Total cost in a year (tk) | 38,66,825 |
| Cost per bird (tk) | 386.68 |
| Total income in a year (tk) | 79,50,000 |
| Gross income per bird (tk) | 795.0 |
| Profit from per bird (tk) | 408.320 |
| Cost effectiveness ratio (cost per bird/profit per bird) | 0.95 |

The profit made by quail farming per year is significant and the above mentioned finding about the profitability agrees with (Das et al., 2008)

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The Author

BIOGRAPHY

I am **Muntachir Bin Noman**, son of Dr. A. N. M. Badruddin and Mrs. Shahana Akter. I passed Secondary School Certificate examination in 2007 from Govt. Muslim High School, followed by Higher Secondary Certificate examination in 2009 from Chittagong Model School & College. Now I am an intern veterinarian under the Faculty of Veterinary Medicine in Chittagong Veterinary and Animal Sciences University. In the future I would like to work as a veterinary practitioner and do research on clinical animal diseases in Bangladesh.