Chapter 1

Introduction

Pigeon rearing and breeding is a part of livestock and poultry and it can contribute to the economy of a country. Pigeon rearing is hugely popular both in rural and urban areas. It is considered as a ready cash source of income and provides employment opportunities for villagers especially for poor women and educated unemployed youth (El-Hanoun et al., 2008).

Pigeon is a very popular domestic bird both in rural and urban area. The commonly found breeds in Bangladesh are Gola, Giribaz, Siraji, Serting, Mayouri. But a huge number of people are not aware about breeds. As a result, mix breed pigeons are also very commonly found. It is a bird from Columbidae family which is very calm, domestic and highly prolific. The birds are very close to human civilization in terms of a source of food, a hobby and research purposes (Giford, 1941; Sari et al., 2008). Generally, in urban area and city, for natural beautification and as source of recreation, people rare pigeon. In village area, 'pigeon rearing' is practice for meat purpose in home consumption and very few people practice it for commercial purpose as income generation activity (Biman et al., 2020). It is an intelligent bird which can also be used as game gird and messenger.

Bangladesh has a long history for backyard pigeon farming. The climate and vast areas of different crop field along with housing premises of Bangladesh are very suitable for pigeon farming (Asaduzzaman et al., 2009).

The backyard farming system of pigeon is increasing day by day. The feed for scavenging pigeons is in range between 32.5-42.5 gram/day, with an average of 38.1gm/day (Islam, 2010). A little amount of water is required. The pigeons are highly prolific. There is a large market for pigeons due to the delicious taste of their meat, which possesses abundant nutrients such as proteins, vitamins, calcium, and iron (Bhuyan P et al., 1999). Squab meat is found at the early stage of development in young pigeon. Squab is 'Scandinavian' phrase, which means 'loose, fat flesh' (Merriam-Webster's Collegiate Dictionary, 2009).

The contribution of pigeon has not yet been considered, in relation to the contribution of livestock sub-sector and whole poultry production though the pigeons provide alternative source of animal protein (Asaduzzaman et al., 2009). The common observations of backyard pigeon farming are comparatively low investment, less feed and housing cost involved, easy and economic husbandry practices, short reproduction cycle and less disease (Ashraful et al., 2021). Droppings from pigeon can be used as source of bio-fertilizer specifically for small garden and used as the laboratory animal in case of genetic and hormonal studies (Asaduzzaman et al., 2009). As a result, it can be a good source of easy family income.

Parasitism, retarded growth, low egg production and susceptibility to other infections are common findings (Dranzoa et al., 1999). Pigeon pox and Newcastle disease are also found in some cases. Vaccination and rationing of feed are less concerned matter among the backyard farmers. Production can be increased if the matters are checked.

The current study was conducted to record present status, problems and prospects and to formulate some suggestion about pigeon farming in the Amirabadh, Paulpara under Lohagara upazilla and Kulaldenga under Chandanaish upazilla at Chattogram district.

Chapter 2: Objectives of the study

1. To analyze the economic condition of the backyard farming of pigeon.
2. To evaluate production performance and profitability of raising pigeon in rural areas.
3. To identify the problems of pigeon farming found in field.

Chapter 3: Materials and Methods

The survey was conducted in Amirabadh, Paulpara under Lohagara upazilla and Kulaldenga under Chandanaish upazilla of Chattogram district. For collecting data on pigeon rearing practices, especially on feeding and housing systems, squab production and sells at backyard level pigeon farming, a questionnaire is developed. An easy interview was taken from farmers to gather information where both open and close questions were arranged. The farmers and the areas of survey were chosen purposefully.

3.1 Duration of the study

The study was conducted from 1.2.2021 to 18.6.2021.

3.2 Selection of the study area

Ten backyard pigeon farmers were selected purposively from Amirabadh, Paulpara under Lohagara upazilla and Kulaldenga under Chandanaish upazilla in Chattogram.

The main considerations in selecting the study areas were as follows:

1. Availability of pigeon farmers in the study area.

2. Good communication facilities and co-operation from the owners of backyard pigeon farming.

3. No study of this type was done previously in this area.

3.3 Selection of sample and sampling technique

In total, ten families were randomly selected from Amirabadh, Paulpara under Lohagara upazilla and Kulaldenga under Chandanaish upazilla in Chattogram.

3.4 Inclusion criteria of study population

Key units having at least 2 pairs to maximum 10 pairs of pigeon reared under backyard condition.

3.5 Method of data collection

The data was collected through a program of direct interviews by a pre-tested questionnaire. The program has been prepared while maintaining its relevance to the objectives of the study.

3.6 Analytical technique

After data collection, the data was organized in a tubular form and was analyzed according to the objectives of the study. Simple statistical measures such as arithmetic mean, benefit-cost ratio were used in this study. It should be noted that, for analytical purposes, the cost and income per pair of bird in a year were estimated.

Chapter 4: Results

The data presented in Table 1, was collected from Amirabadh, Paulpara under Lohagara upazilla and Kulaldenga under Chandanaish upazilla in Chattogram for investigating the backyard small scale pigeon farming system. A questionnaire was developed to collect data from the selected farms, where the main focus was to collect the data of squab production.

Table 1: Data collection from 10 backyard farm

Parameter										
Farm No	1	2	3	4	5	6	7	8	9	10
No. of pigeon reared(In pair)	5	8	2	3	7	7	6	6	2	4
Feed supply (gram/ day/pigeon)	35	38	43	37	31	38	32	46	36	40
Feed cost (TK/month/pigeon)	42	44	45	42	35	40	38	49	40	45
Cost of housing	310	445	700	356	540	320	339	302	600	480
Duration of housing (months)	24	36	60	48	36	24	36	48	60	48
Clutch size/pair	2	2	2	2	2	2	2	2	2	2
Days between subsequent clutch	20	15	18	17	16	14	15	21	18	15
No. of egg/year	100	144	32	42	112	104	90	80	28	68
No. of squab/year	50	72	16	21	56	52	45	40	14	34
Marketing age (days)	32	25	30	30	35	30	28	28	35	30
Average price of squab (TK/pigeon)	150	110	130	120	150	120	130	110	150	130
Average price of adults(TK/pigeon)	400	350	360	450	280	320	340	400	450	300

4.1 Housing of the pigeon

In the Table 2, various prices of different types housing system can be found. Three types of housing system are classified here according to average market price in particular price ranges. The classified housing systems are - high of cost housing (Tk.500-1000), which was less common, for medium cost of housing (Tk.350-500), which was common and low cost of housing (Tk.300-350), which was most popular in our selected areas. Maximum cost of pigeon house was Tk. 700, while minimum cost was Tk. 302.

40% pigeon farmers found duration of pigeon house 3-4 years, 20% found 7-8 years and rest 40% found 5-6 years (Asaduzzaman et al., 2009). According to data findings of this study, the average duration of the stability of the houses is 42 months or 3.5 years.

Table 2: Cost of housing in pigeon production

Categories	Range (TK.)	No. of Pigeon	Total cost (for 42 months)	Average cost of housing per bird (Tk.) (for 42 months)	Average cost of housing per bird per month (TK.)
Low cost of housing/pair	300-350	48	7636	159.08	3.78
Medium of cost housing/pair	350-500	30	6548	218.26	5.20
High cost of housing /pair	500-700	22	6380	290	6.91
Total		100	20564	205.64	4.9

4.2 Feeding of pigeon

In the Table 3, we can found that, the feed cost of pigeon has reached up to Tk.37.65 taka/per kg on average, as different kinds of feed mixtures are very popular and commonly found in rural areas of Bangladesh as well as our interviewed area, according to Table 1.

Table 3: Average feeding of pigeon

Categories	Range(g)	Average(gram/day/pigeon)	Average price of per kg feed(Tk.)	Average cost of feed/ per pigeon/month(Tk.)
Low	35-40	37.18	37.65	42
Medium	40-45			
High	45-50			

4.3 Feed item supplied to the pigeon

Different types of feed ingredients are supplied to the pigeon like rice grain, hard wheat, rice polish, rice, puffed rice, mustard seed, sun flower seed, peas, yellow corn etc. Specific data on feed ingredients was not found as the feeding system varies and hugely depended on availability of feed and economic condition of farmer.

4.4 Marketing of pigeon and squab

Marketing age of squab was grouped into 3 categories i.e., 25-28 days, 29-32 days and 33-35 days.

Table 4: Marketing of pigeon and squab

Marketing age of pigeon	Average age of marketing	No. of new born birds/year	Average price	Income(tk) /year (from 50 adult pair)	Income(tk)/ per bird(sell)
25-28 days	30.3 days	157	130	20410	179.78
29-32 days		173	150	25950	
33-35 days		70	365	25550	
Total		400		71,910	

4.5 Production of squab/year/pair of pigeon

According to Table 1, squab production per pair of pigeon is 8 pair squab/year on average.

In mathematical calculation:

Pair of squab/pair/month = number of total squab ÷ month

= 8 ÷ 12

= 0.67

Cost benefit analysis

Cost

The cost per month per bird is calculated according to above information. Table 5 is showing the information of the monthly cost of a single pigeon.

Table 5: Average monthly cost for per bird

Parameter	Cost(taka)
Housing cost	4.9
Feed cost	42

Return

Per pair of pigeon produce 8 pair of squabs yearly according to our study. In case of mathematical calculation, per pair of pigeon produce 0.67 pair of squab/month, where the value of per squab is 179.78 taka.

So, monthly income from per pair of squab = 0.67 × 2 × 179.78 taka = 240.9 taka

The yearly cost-benefit analysis is done below in Table 6.

Table 6: Cost benefit analysis from per pair of bird

Parameter	Monthly cost/per bird(taka)	Monthly cost/pair(taka) **A1**	Yearly cost/pair(taka) **B1**	Monthly return/pair(taka) **A2**	Yearly return(taka) **B2**	**Monthly profit (A1-A2)**	**Yearly profit (B1-B2)**
Feed cost	42	84	1008	-	-	-	-
Housing cost	4.9	9.8	117.6	-	-	-	-
Squab sell	-	-		240.9	2890.86	-	-
Total		**Σ A1 = 93.8**	**Σ B1 = 1125.6**	**Σ A2 = 240.6**	**Σ B2 = 2890.86**	**Σ (A1-A2) = 146.8**	**Σ (B1-B2) = 1765.26**

So, the yearly Benefit-Cost Ration **(BCR)** = **Σ B2 ÷ Σ B1**

= 2890.86 ÷ 1125.6

=2.56

Chapter 5: Discussion

This study is carried out to analyze the socio-economic contribution of backyard pigeon farming in rural areas like Amirabadh, Paulpara under Lohagara upzilla and Kulaldenga under Chadanaish upazilla in Chattogram. Ten farms were chosen at random for this study from those areas.

Of all the breeds, Giribaz has the highest percentage of pigeons raised by pigeon farmers (Asaduzzaman et al., 2009). 50% of the farmers liked Gola, 37.5% of them liked Giribaz, 5% of them liked Siraji, 5% of them liked Serting and rest 5% liked Mayouri / Local breed of pigeon (Islam, 2010). But according to this reports, the majority of pigeon farmers weren't familiar with the different breeds and variations of pigeons.

Pigeon rearing is generally easier in rural areas due to the great amount of open space and abundance of fields where they can readily manage their food (Biman et. al., 2020). Pigeons are strong guardians of their nesting grounds and homes (Castoro et al., 2008). In the current study, pigeons were grown in a semi-intensive manner where the houses were made from wood, plastic and bamboo. In some farms, steel cage were used.

We discovered that, the cost of accommodation per bird is Tk. 205.64 in this investigation. The costing of housing for every pigeon is only 14.00TK (Levi, 1957). It’s a lot a less than the present research. Pigeons were grown in scavenging settings in this study and the nests were used as night shelter to protect them from predators.

Pigeon housing cost around TK 1.00/month/pigeon (Assaduzzaman et al., 2009). The house cost of pigeon was about TK 2.00/month/pair (Ashraful et. al., 2021). But in our study, we observed that, it is TK 4.9/month/pigeon. As the price of construction materials used for pigeon in this study is high as well as the price is increasing day by day, a variation is found.

We can found that, the feed cost of pigeon has reached up to Tk.37.65 taka/per kg on average, as different kinds of feed mixture is very popular and commonly found in rural areas of Bangladesh as well as in our interviewed area. Therefore, spending on feed (37.18 gram/day) for each pigeon was Tk. 42.00 per month on average. Feeding one pair of pigeon requires about 74.36 gram of feed which cost about Tk. 84.00 per month. Strand Magazine (1901) reported that, feed intake per pigeon per day was 47.35 gram which was slightly higher than the present observation. The differences have possibly been arisen because in the present study, pigeons were reared in scavenging system and farmer supplied only supplementary feeding whereas, in other studies the pigeons were reared in confinement. Scavenging ability of pigeon is higher than that of chicken because pigeon can travel long distance in search of food. Information was collected on supplementary feeding only. But the total feed intake was not possible to record by farmers.

In this study, squab production per pair of pigeon is 8 pair squab/year on average. But the number of squab was found 11.4 squabs/pair/bird (Platt et al., 1937). There is a belief that, good commercial pair of pigeon should produce 18 to 20 pair squab/year (Levi, 1957) which is hugely greater than the findings of this study. Poor hatchability, homosexuality of pairs and disease has been reported by farmers as reasons to deplete prolificacy in pigeon.

Most of the pigeon farmers sold their squab within 29-32 days, another group of farmers were interested to sell during 25-29 days and the rest of the farmers sold in 33-35 days with the average of 30.3 days. In 1957, Levi reported that, the marketing age ranges from 25 to 35 days, with an average of 30 days, which corresponds to the time frame of our study. When it came to squab consumption, people's preferences differed from country to country.

Pox, ND, Salmonellosis, and mineral insufficiency were all common diseases that the birds suffered from. The death rate was 6% on average (Ashraful et al., 2021). Domestic pigeons are harmed by infectious diseases such as Salmonellosis, Colibacillosis, Staphylococcosis, Newcastle disease, and Pigeon pox. Newcastle disease is a global avian disease that can cause large financial losses in commercial poultry

operations (Herdt et al., 2000). Pigeon pox virus infection may cause a high death and morbidity rate in pigeons (Tripathy, 1991). But no such data were found in this study, as the selected farmers of this study were not able to give proper information about diseases as well as were not enough aware about vaccination. If proper vaccination and medication can be ensured, it would give a huge economic benefit to the farmers.

Backyard system pigeon farming is a good source of income. In our study, we found 146.8 taka benefit from per pair of pigeon monthly and 1765.26 taka benefit yearly from per pair of bird. The yearly BCR (benefit-cost ratio) was 2.56. BCR 2.56 indicates that, if a farmer invests 1 taka, he will get 2.56 taka yearly from per pair of bird.

This study shows that, it can be a huge source of income for small scale farms as well as large scale farmers. The production can be increased if the vaccination, medication, good feed formulation, good breeds of pigeon is introduced.

Chapter 6: Limitation of the study

1. Farmers did not appear to be equally cooperative and welcoming. They tried to flee during the interviews on several occasions.
2. Farmers, on the whole, did not retain any written records of their farm activities.
3. No data about vaccination is found.
4. No data about mortality is included to this study.
5. Only feeding and housing cost is considered. Other partial costs are excluded.

Problem identification in farm:

The following problems are identified in general from the response of the interview

I. Lack of improved breed.

II. Lack of available medicinal supports such as vaccination support, treatment support.

III. Lack of availability of feed.

IV. Lack of government supervision.

Chapter 7: Conclusions

In Bangladesh, pigeon rearing is a profitable business. Feeding was a major undertaking here. Farmers were unaware of the pigeon's exact ration and feed value. The vast majority of pigeon owners were completely unaware of their bird's genuine characteristics. As a result, when they purchased it, some bad characteristics arose, and they were unable to keep the pure breed, failing to find actual value. Ingredients in feed, feed volume, and clean water are all essential for a commercially successful farm. Meat yield analysis of squab across various breeds and types of pigeon available in Bangladesh is necessary in the future for improved performance.

Pigeon farming is not well structured in rural areas of Bangladesh. The majority of individuals raise pigeons on a modest scale using a scavenging strategy and just supply supplementary nutrition. Farmers raise desi or mixed breed pigeons with no knowledge of the slandered pigeon type. It's a lucrative business and pigeon meat is expensive. Pigeon farming will expand in the future if the government takes steps to teach farmers in management and extend financing. The introduction of improved breeds and variations may result in increased income and job opportunities.

References

Anonymous, (1901). The only pigeon ranch in the world. The Strand Magazine. April, pp. 534–535.

Asaduzzaman M, Mahiuddin M, Howlider MAR, Hossain M and Yeasmin T (2009). Pigeon farming in Gouripur upazilla of Mymensingh district. Bangladesh Journal of Animal Science 38: 142-150.

Ashraful H, Hamida K, Nahid M (2021). A Study on Pigeon farming system in Hakimpur Upazila of Dinajpur District in Bangladesh, ISSN Number: 2773-5958, SSM Number: 201901038138(1347468-T), www.icrrd.com

Bhuyan P, Nath D, Hazarika M. Influence of age and sex on nutritive value (proximate composition) of squab and pigeon meat. Indian Veterinary. Journal. (1999); 76:530–532.

Biman M, Tarun D, Bablu G and Kausik P (2020). Pigeon Rearing An Investment Analysis for Secondary Income Generation to Farm Women, Landless, Marginal and Small Farmers , *38(6): 1-6, 2020; Article no.AJAEES.58316 ISSN: 2320-7027*

Castoro and Guhl (2008).“Pairing Behavior of Pigeons Related To Aggressiveness and Territory” (Web article). The Wlson Bulletin. http:// elibrary. unm. edu/ sora/ Wilson/ v070n01 /p0057-p0069.pdf. Retrived (2008-04-07).

Dranzoa, C., Ocaido, M & Katete, P. (1999). The ecto-, gastro-intestinal and haemo parasites of live pigeons (Columba livia) in Kampala, Uganda. Avian Pathology. 28: 119-124.

El- Hanoun AM, Hassanein MNF, Sabra ZAM. Studies on native pigeons under Egyptian village Nile Delta conditions. Egyptians Poultry Science Journal. (2008); 28(3):883-900.

Gifford, E. W. (1941). Taxonomy and habits of pigeons. Auk, 58: 239-245.

Herdt, P. D. and Devriese, L. (2000). Pigeons. In: Avian Medicine, by Tully, T. N., M. P.C. Lawton, G. M. Dorrstein (Eds.) Reed Educational and Professional Publishing Ltd. Oxford, UK., pp: 330

Islam MR (2010): Pigeon farming and meat yield of some genetic groups in Mymensingh district, MS Thesis, Department of Poultry Science, Bangladesh Agricultural University, Mymensingh, Bangladesh.

Levi W (1957). The Pigeon Sumter, S. C. Levi Publishing Company, Inc. p. 537. ISBN 0853900132.

Merriam-Webster's Collegiate Dictionary (2009): Squab.

Platt, C. S. and Dare, R. S. (1937). Squab production. New Jersey Agric. Exper. Station Bull. 634.

Sari, B., Karatepe, B., Karatepe, M. & Kara, M. (2008). Parasites of domestic pigeon (Columba livia domestica) and wild (Columba livia livia) pigeons in Niğde, Turkey. Bull Vet Inst Pulawy. 52: 551-554.

Tripathy, D. N. (1991): Pox. In Textbook of Diseases of poultry, Calnek, B.W. Iowa State University Press, Ames, Iowa., 583.

Acknowledgements

The author bends his head to the Almighty who is omnipotent, omniscient and omnipresent for His endless blessing to conduct this research work for the fulfillment of the requirement for the degree of Doctor of Veterinary Medicine (DVM).

The author desires to express his earnest gratefulness and profound appreciation to the following persons for the accomplishment of this dissertation.

The author convening his gratitude and great appreciation to the venerable internship supervisor Professor Dr. Omar Faruk Miazi, Department of Genetics and Animal Breeding, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University, for his valuable guidance, suggestion, supervision and encouragements during the entire period of this study to complete this production report.

The author expresses his thankfulness to all the friends of his batch for their co-operation and instructive suggestions.

Last but not least, the author is profoundly grateful to the parents and other family members for their endless sympathies, kind co-operation, sacrifices and prayers.

The Author

Biography

I am Piyal Paul, son of Palash Kanty Paul and Nibadita Paul. I passed my Secondary School Certificate (SSC) examination from Chittagong Government High School, Chittagong in 2012 and Higher Secondary Certificate (HSC) examination from Chittagong College, Chittagong in 2014. I enrolled for Doctor of Veterinary Medicine (DVM) degree in Chattogram Veterinary and Animal Sciences University (CVASU) Bangladesh. I have immense interest to work in the field of ‘Pet animal medicine’.