Research article

Ecology Journal

ISSN (Print): 2957-4471, ISSN (Online): 2957-448X, Website: https://journal.esbangladesh.org
Ecol. J. (2026) 8 (2) : 135-144

Production practices, disease status, constraints, and economic performance of commercial pigeon farming in Bangladesh

Abu Nasar Md. Aminoor Rahman[1]*, Md. Saddam Hossain[2], Ziban Chandra Das[1], M. Nazmul Hoque[1], Tima Tisa Mallick[1] and Khaled Hassan Shuvo[1]

[1]Department of Gynecology, Obstetrics and Reproductive Health, Gazipur Agricultural University, Gazipur 1706, Bangladesh. [2]Department of Medicine and Surgery, Chittagong Veterinary and Animal Sciences University, Khulshi, Chittagong, Bangladesh.

***Corresponding e-mail:** aminoor69@gau.edu.bd

Received: 26 July 2026, revised: 14 August 2026, accepted: 15 August 2026, DOI: https://doi.org/10.59619/ej.8.2.5

Abstract

The study was conducted to investigate the status, constraints, and prospects of commercial pigeon farming in Bangladesh. The study was carried out in 10 districts from July 2015 to June 2017. Data were collected through direct interviews with pigeon farmers using a structured questionnaire, along with focus group discussions. Among the 100 farms surveyed, 35% were owned by students, followed by service holders (21%) and businessmen (20%). Most farmers (59%) were young (20-29 years), and farmers with bachelor's or master's degrees were predominant (47%). Mixed farming was the most common production system (72%), followed by fancy pigeon farming (23%) and squab production (5%). Most farmers (67%) reared fewer than 50 pairs of pigeons, and cage rearing (76%) was more common than floor rearing (22%). Disease problems were experienced by 97% of the farmers, with higher occurrence during winter (49%), and squabs were more affected (76.8%) than adults (23.2%). However, only 25.5% of the farmers regularly used drugs or additives in feed and water. Newcastle disease (27.31%) was the most prevalent disease, followed by salmonellosis (19.51%), pigeon pox (18.04%), infectious coryza (5.85%), canker (5.85%), and chronic respiratory disease (1.46%). Most farmers spent 150-500 BDT per month on medicine, while 68% earned a monthly profit of 5000-10000 BDT. The major constraints of pigeon farming were market instability, lack of knowledge and training, disease outbreaks, inadequate vaccination facilities, and poor biosecurity practices. The findings indicate that with proper training, improved health management, biosecurity measures, and market development, commercial pigeon farming has considerable potential as a sustainable income-generating enterprise in Bangladesh.

Keywords: Pigeons, status, problems, prospects, Bangladesh.

Introduction

Worldwide, pigeon is considered as the symbol of peace. Pigeon keeping is the art and science of breeding domestic pigeons. They are related to human since ancient time (3000-5000 BCE) and people have practiced pigeon keeping in almost every part of the world (Levi 1977). Probably pigeon is the first bird species to have been reared by humans (Johnston and Janiga 1995). In that time, mankind has substantially altered the morphology and the behavior of the domesticated descendants of the wild rock pigeon (*Columba livia*) to suit its need for food, aesthetic satisfaction and entertainment. Almost all types of people who have facilities, love to raise some pigeon in their home. They live side by side with human as a source of food, hobby and experimental purposes (Sari *et al*. 2008). People who breed pigeons are commonly referred to as pigeon fanciers (Levi 1977).

Pigeon farming is very interesting and profitable worldwide. It requires less labor and low investment. Even one can raise and take care of the pigeon during his leisure time. The meat of squab (baby pigeon) is tender, tasty, nutritious and restorative. Squabs also have huge demand and price in the market. Squabs have never flown and have never usually eaten anything except 'pigeon milk', which is formed in the crops of both parents during the incubation period. Squabs are ready to fly and leave their nest at about 26-30 days of age. At this age they weigh about 500 grams (g) and are ready to market for the table (Bolla 2007). Therefore, pigeon farming became an easy source of income generation and entertainment. Raising pigeons using modern methods is very profitable than traditional way.

Keeping pigeon is almost common in the villages of Bangladesh. In this country people usually rear different

local breeds for hobby and meat purpose. But now a day demand for different types of fancy breeds increased not only in Dhaka or Chittagong, but also other parts of the country. Because pigeons are now raised for racing and show purposes in addition to meat and hobby, therefore, to fulfill this demand pigeon fanciers and businessmen started raising different types of fancy breeds, varieties, and even species of pigeon. These birds are expensive to highly expensive which are sold between 10000 (ten thousand) BDT and 1000000 (ten lac) BDT a pair. Recently, a number of commercial pigeon farms (small to big) have been established all over the country. Currently, there are more than 2000 pigeon breeders in Dhaka city with more than 20000 scattered across the country, especially in Chittagong, Rangpur, Dinajpur and Barisal.

Although the number of pigeon breeders (fanciers) and farms are increased, however, there is a lack of knowledge and skills on husbandry, breeding and disease management of these highly expensive birds. As raising expensive fancy breeds are not as easy as local breeds, therefore, pigeon fanciers are currently facing various problems including health problems. Squabs are mostly affected with different types of bacterial, viral and fungal infections as well as parasitic infestations which causes retarded growth, low egg production and susceptibility to other infections. This ultimately results in financial loss in this new enterprise.

Although, commercial pigeon rearing has immense potentialities as a new dimension in poultry farming, however, till now the distribution, status, disease management, problems and prospects of commercial pigeon farming in Bangladesh has not explored and evaluated. Keeping this in mind the present piece of work has been undertaken to obtain thorough and detailed information on the present status of different breeds of pigeon and their disease management in some selected areas of Bangladesh.

Reports on different aspects of pigeons (Abulude *et al.* 2006, Beilken *et. al.* 2007, Pomianowski *et al.* 2009, Ibrahim and Sani 2010) including diseases of pigeon (Wehr and Hwang 1964, Dranzoa 1999, Marques *et al.* 2007, Danapat *et al.* 2012) in different countries have been published. A review of available literatures revealed only one report on pigeon farming and several others on pigeon diseases in Bangladesh (Begum and Shaikh 1987, Nasrin 2004, Begum *et al.* 2008, Islam *et al.* 2009, Asaduzzaman *et al.* 2009, Musa *et al.* 2011). A survey on status, problems and prospects of pigeon farming in rural Bangladesh was conducted using a pre-tested interview schedule (Asaduzzaman *et al.* 2009). Their results revealed housing cost, height of house, duration of house, quantity of feed supplied to each pigeon/day, male female ratio, marketing age, weight, price of squab, number of squab/pair of pigeon, production of squab/year/pair of pigeon, price of each pigeon and mortality of pigeon were 113.33 BDT, 3.50 m, 5 years, 34.50 g, 1.07, 26.66 days, 258 g, 51 BDT, 1.67, 19.53, 113.33 BDT and 6.67%, respectively. Most of the pigeon farmers raised pigeon in small scale scavenging system with supplementary feeding. They had no idea on breeds and varieties and prevention of diseases. Begum and Shaikh (1987) and Nasrin (2004) recorded parasites of pigeons in Bangladesh. Islam *et al.* (2009) found that 28.60% and 85.70% pigeons, respectively, were affected with bacterial infections and parasitic infestations in Gaibandha district of Bangladesh. Their results indicated that pigeon raised in scavenging or free-range system were more susceptible to helminth parasites. Musa *et al.* (2011) found one species of nematode and five species of ectoparasites in pigeons which were randomly purchased from the local market. All these reports were on small scale free range or home raised pigeons. Although one recent study reported some management practices of commercial pigeon farming (Akter *et al.* 2021) in the country, however, review of available literature revealed no reports on distribution, status, breeding, disease management, problems and prospects of different pigeon breeds and commercial pigeon farming in the country which is very much important in respect to present situation of commercial pigeon farming in Bangladesh.

Materials and methods

Study area: Commercial pigeon farming is comparatively an emerging entrepreneurship in Bangladesh, attracting increasing interest among young entrepreneurs. Therefore, study locations were selected based on the presence of pigeon farms, covering 10 selected districts across the country. Data were collected from 100 commercial pigeon farms distributed in 10 selected districts including Barishal, Chattogram, Comilla, Dhaka, Khulna, Moulovibazar,

Natore, Pabna, Rajshahi and Sylhet according to the farm list collected from pigeon breeders. Number of farm(s) in each district where study was carried out is depicted in the Figure 1. Bangladesh is vulnerable due to its position in the globe (South Asian country). The climate is tropical; mild winter (October to March), hot, humid summer (March to June), humid, warm rainy monsoon (June to October). The country's total land area is about 147570 km^2 and geographic position is Latitude: 20°45' to 26°40'N, Longitude: 88°05' to 92°40'E. The average annual rainfall varies from a maximum of 5690 mm in the northeast of the country to minimum of 1110 mm in the west. The day temperature ranges from 7 to 14 degree centigrade in the cool months and in the other months it varies between 23 to 40°C.

Data collection: The samples of this study were commercial pigeon farmers (small, medium and large) including, successful farmers, unsuccessful farmers those have already closed their farms, new farmers and interested peoples who want to start commercial pigeon farming. A structured questionnaire schedule was prepared for interviewing the available commercial pigeon farmers in the selected areas of Bangladesh. This questionnaire was first piloted on a very small group of farmers and then the questions had been restructured in accordance with their responses. Target pigeon farms were selected using purposive convenience sampling based on regional availability and farmers' willingness to participate in the structured questionnaire survey. Selected pigeon farms were visited and information on the number of breeds, breeding methods, frequency of egg laying, mortality and diseases of both squabs and adult pigeons was screened and recorded. Disease identification relied on presumptive clinical diagnosis via structured questionnaires, field physical examinations, and characteristic post-mortem gross lesions assessed by trained veterinarians as told by the farmers during the farm visits. Focus group discussions were also is carried out with both successful and unsuccessful farmers whenever necessary. High resolution digital camera (Panasonic DMC FZ50, Cannon SX60HS or Cannon EOS 7D) was used to take photographs and video clips of different breeds, eggs, squabs, disease symptoms, external condition of diseased and infected pigeons, feeds etc.

Statistical Analyses

Data collected through the structured questionnaire were entered into Microsoft Excel, 2007, coded, checked for consistency, and analyzed using the Statistical Packages for Social Sciences (SPSS), version 11.5 for windows (SPSS, Inc., Chicago, IL, USA). Descriptive statistical

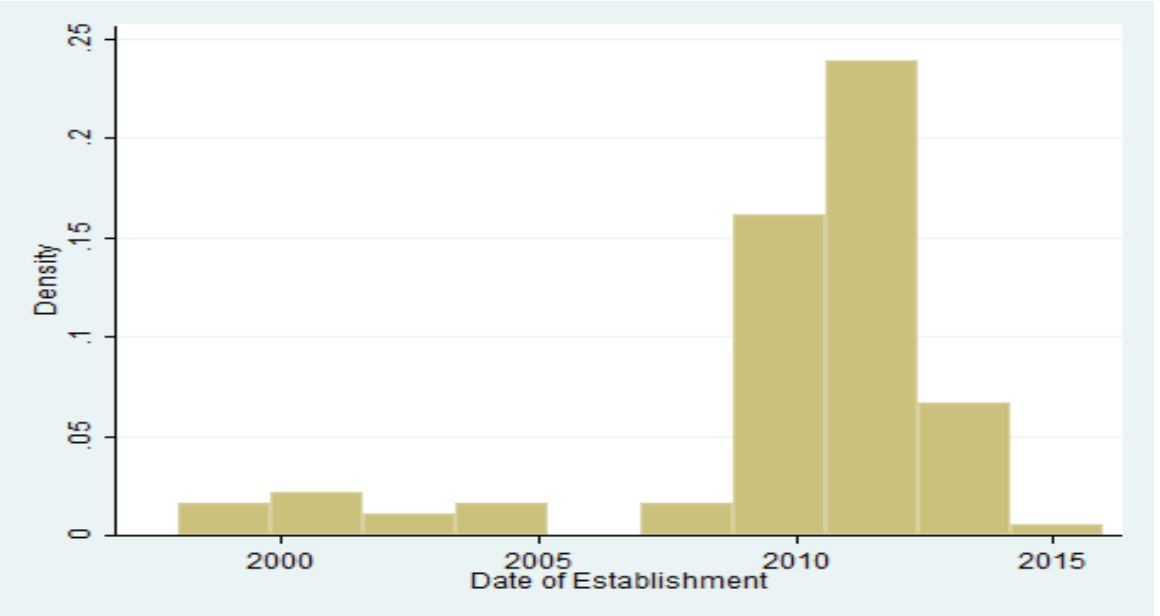


Figure 1. Number of commercial pigeon farms in selected districts of Bangladesh

analysis was performed using frequency distributions and percentages for categorial variables, while ranges were used to summarize continuous variables where appropriate. The results were presented in tables and graphical forms to describe the production practices, disease occurrence and management, constrains, and economic characteristics of commercial pigeon farming.

Results and discussion

Farmer characteristics and farm development: To the best of our knowledge, there are no studies available on the present scenario, prospects and major constraints of commercial pigeon farming in Bangladesh and this one might be first ever study in this regard. Therefore, this dataset as a foundational baseline representing a key transition period in Bangladeshi urban/peri-urban aviculture, providing a benchmark for future longitudinal studies. The study was carried out in 100 commercial pigeon farms and among these, 98 farms (98%) were operated by male and only 2 (2%) were operated by female. Commercial pigeon farming in Bangladesh was started in 1998 and remained static for about one decade (1998-2008) since its inception, thereafter, there was a drastic increment in 2010 which increased till 2012 (highest in 2012) and again declined thereafter (Figure 2). The reasons might be drop of price per pigeon, breeding factor, faulty farm management, higher feed price, higher incidence of different infectious diseases, and lack of veterinary care. Status of farmers and their roles in pigeon farming in Bangladesh has been shown in Table 1.

From Table 1 it is evident that out of 100 farmers, 35% were students, 21% service holder, 20% businessman, and 24% had other professions. It is also evident that most of the farmers (59%) were young (20-29 years old), followed by mid age (30-39 age 25%), very young (<20 years 9%) and old ages over 40 years (7%). The study also revealed that most of the farmers were educated (43% had bachelor's degree) followed by HSC pass (34%) and SSC pass (10%). There was not much difference between the number of married and unmarried farmers. Although, most of the farmer's target was to make the farm commercial, however highest number (86%) of farmers started the pigeon farming as hobby. As shown in the table-1 that while 60% pigeon farmers motivated others to start new farms, very few provided hands on support through training (1%), technical guidance (9%), or financial aid (7%). The study also revealed that most of the farmers were engaged in mixed farming (72%) *i.e.* production of both squab (meat) plus fancy pigeon breeds followed by only fancy pigeon production (23%) and least was only squab production for meat (5%).

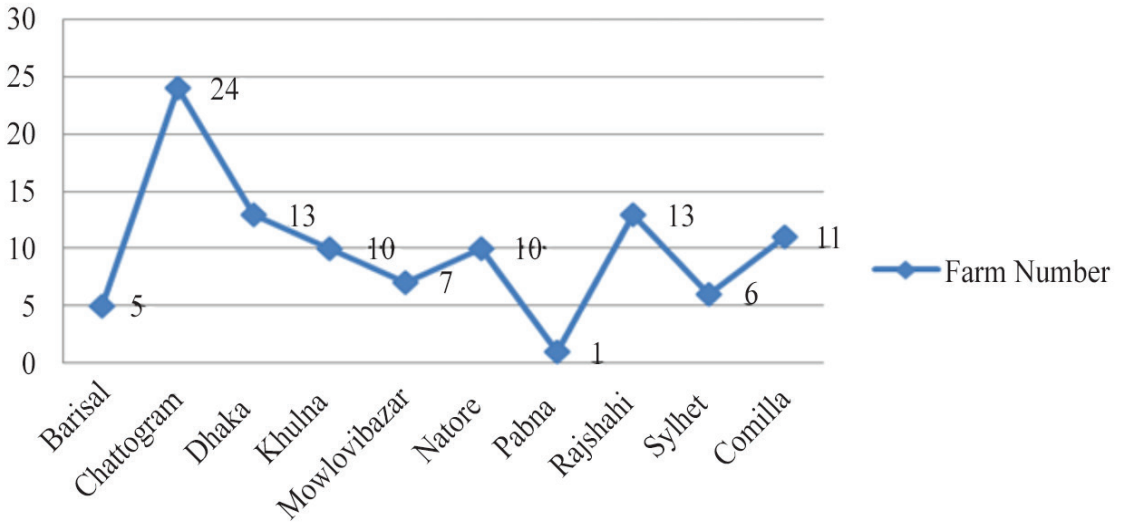


Figure 2. Establishment of commercial pigeon farms in Bangladesh (1998 to 2015)

Table 1. Status of pigeon farmers and their roles in commercial pigeon farming (n=100) in Bangladesh

Parameters	Category	Frequency (%)
Farmer's occupation	Businessmen	20 (20%)
	Service holder	21 (21%)
	Student	35 (35%)
	Others	24 (24%)
Age group of farmers (years)	<20	9 (9%)
	20-29	59 (59%)
	30-39	25 (25%)
	40-49	4 (4%)
	50 and above	3 (3%)
Educational background	Below SSC	9 (9%)
	SSC	10 (10%)
	HSC	34 (34%)
	Bachelor's	43 (43%)
	Masters	4 (4%)
Marital status	Married	48 (48%)
	Unmarried	52 (52%)
Interest in pigeon farming	Business	1 (1%)
	By neighbor	1 (1%)
	By friends	12 (12%)
	Hobby	86 (86%)
Role in spreading pigeon farming	Provide training	1 (1%)
	Motivate to establish new farm	60 (60%)
	Provide technical support	9 (9%)
	Provide financial support	7 (7%)
	Consultancy	8 (8%)
	None	15 (15%)
Farm type	Squab production	5 (5%)
	Fancy pigeon production	23 (23%)
	Mixed farming	72 (72%)

Farm Management Practices: Different farm management practices in commercial pigeon farms have been depicted in Table 2. From the table it is evident that highest number of farmers (67%) had <50 pairs of pigeons, followed by 50-100 pairs (25%), 101-200 pairs (4%), and 201-1000 pairs (2%). In terms of housing, the highest proportion of farmers kept their pigeons in dedicated farm houses (31%), followed by flats (30%), and verandas or rooftops (20%). Additionally, 76% farmers used cages (intensive systems), whereas only 22% raised them on the floor (semi-intensive systems). In contrast, Akter *et al.* (2021) reported that out of 45 pigeon farms, 55.6% relied on intensive rearing systems, 26.7% on scavenging, and 17.8% on semi-scavenging system. Similarly, Prasad *et al.* (2017) categorized housing into six distinct systems based on the construction materials of the cages. Our study revealed that the highest proportion of farmers (40%) used a combination of original and foster breeds (mixed) to incubate eggs, followed by foster breeds only (37%), original breeds only (16%), and hybrids (7%).

Table 2. Farm management practices in selected commercial pigeon farms (n=100)

Parameters	Category	Frequency (%)
Farm size (pairs)	<50	67 (67%)
	50-100	25 (25%)
	100-200	4 (4%)
	200-500	2 (2%)
	>1000	2 (2%)
Type of house	Farm house	31 (31%)
	Inside own flat	30 (30%)
	Veranda/roof	20 (20%)
	Others	19 (19%)
Rearing system	Cage	76 (76%)
	Floor plus wooden box	22 (22%)
	Others	2 (2%)
Incubation of eggs	Original breed	16 (16%)
	Foster breed	37 (37%)
	Mixed (original & foster)	40 (40%)
	Hybrids of original & foster	7 (7%)
Pairing different breeds	Yes	9 (9%)
	No	91 (91%)
Pairing different varieties	Yes	42 (42%)
	No	58 (58%)
Type of feeds	Crumble	5 (5%)
	Grain mix	82 (82%)
	Mixed feed	13 (13%)

Although most of the farmers did not paired different breeds or varieties, but pairing between different varieties was higher (42%) than pairing between different breeds (10%). Grain mix (81.82%) was the major feed item for pigeon in commercial pigeon farming, followed by mixed feed (13%) and crumble (5%). Average amount of feed needed for per pigeon per day was 164 g. Asaduzzaman *et al.* (2009) reported that 46.7% of pigeon farmers provided 32-33 g/day of feed, while 33.3% and 20.0% supplied 34-35 g/day and 36-37 g/day, respectively. In the present study, average feed costs for per kg feed was 55-60 BDT depending on the availability of feed ingredients.

Disease Occurrence and Management: Main constraints for profitable commercial pigeon farming in Bangladesh are different pigeon diseases along with poor disease management practices, lack of bio-security, lack of veterinary service and environmental factors. Data on disease management practices in different pigeon farms in selected areas of Bangladesh is depicted in Table 3. In a study Echols (2010) found that very narrow space, lack of flying, poor ventilation, lack of cleanliness was the main source of several diseases in captive birds. Although most of the farmers (97%) experienced diseases in their farms at some time, but diseases were less frequent in most of the farms (88%). Disease occurrence was higher in winter (49%) than other seasons and squabs (76%) were mostly affected than the adult pigeons (24%). In contrast Paul *et al.* (2015) found high level of pigeon pox in June-July. Winter conditions promote rapid viral transmission in Bangladesh, particularly Newcastle Disease (ND/Pigeon Paramyxovirus-1) and Pigeon Pox, which together accounts for approximately 59.5% of overall seasonal disease cases (Islam *et al.* 2020). The majority of smallholder and rooftop pigeon farmers in this

Table 3. Disease management practices in selected commercial pigeon farms (n=100)

Parameters	Category	Frequency (%)
Experience diseases in the farm	Yes	97 (97%)
	No	3 (3%)
Occurrence of diseases (seasons)	Summer	21 (21%)
	Monsoon	29 (29%)
	Winter	49 (49%)
	Spring	1 (1%)
Frequency of diseases	Frequent	9 (9%)
	Less frequent	88 (88%)
	Rare	3 (3%)
Affected stages	Squab	76 (76%)
	Adult	24 (24%
Drugs/additives used in feed and water	Yes	25 (25%)
	No	75 (75%)

country do not follow standardized vaccination protocols, leaving their birds vulnerable to seasonal field strains (Rahman *et al.* 2022). Cold and damp environmental conditions also favor the survival of endoparasitic oocysts and eggs, while increased indoor flock crowding facilitates their transmission. According to Islam *et al*. (2020), endoparasitic diseases, including coccidiosis, ascariasis, and strongyloidiasis, show their highest seasonal prevalence during winter (23.42%) compared to summer (13.98%). Similarly, comparative clinical studies have reported an overall winter disease prevalence of up to 34% (Rahman *et al.* 2022).

To protect pigeons from cold winds, local pigeon raisers commonly cover wooden or wire-mesh lofts with polythene sheets, sacks, or solid wooden boards during winter months. Although these measures provide insulation, excessive sealing restricts ventilation and promotes the accumulation of humidity and ammonia generated from the degradation of uric acid in droppings. Prolonged ammonia exposure can impair the mucociliary clearance mechanisms of the avian upper respiratory tract, predisposing birds to chronic respiratory disease (CRD) and secondary bacterial infections, including salmonellosis and colibacillosis (Paul *et al.* 2016, Islam *et al.* 2020). Winter also imposes additional metabolic demands on pigeons, which must expend more dietary energy on thermogenesis to maintain their body temperature of approximately ≈41°C. In Bangladesh, pigeons are frequently fed unfortified whole-grain mixtures that may provide inadequate protein and lipids to meet this energy deficit. Consequently, pigeons may enter a negative energy balance, and the resulting metabolic stress can compromise systemic immune function, increasing susceptibility to opportunistic pathogens (Paul *et al.* 2016, Rahman *et al.* 2022).

Majority of the farmers (75%) did not use drugs or additives in feed and water in the present study. Most prevalent disease in pigeon farms was New Castle disease (27.31%) followed by salmonellosis (19.51%), pigeon pox (18.04%) and least was chronic respiratory disease (1.46%) (Figure 3). In their study, Paul *et al.* (2015) found that out of 502 cases, 20.32% pigeons were affected with salmonellosis, 18.92% pigeon pox, and 11.95% canker; among other diseases parasitic infestation (31.67%) was more prevalent. In their study, Begum and Shaikh (1987) and Nasrin (2004) recorded parasites of pigeons in Bangladesh. Islam *et al.* (2009) found that 28.60% and 85.70% pigeons, respectively, were affected with bacterial infections and parasitic infestations in Gaibandha district of Bangladesh. Their results indicated that pigeon raised in scavenging or free-range system were more susceptible to helminth parasites. Musa *et al.* (2011) found one species of nematode and five species of ectoparasitic in pigeons randomly purchased from the local market. All

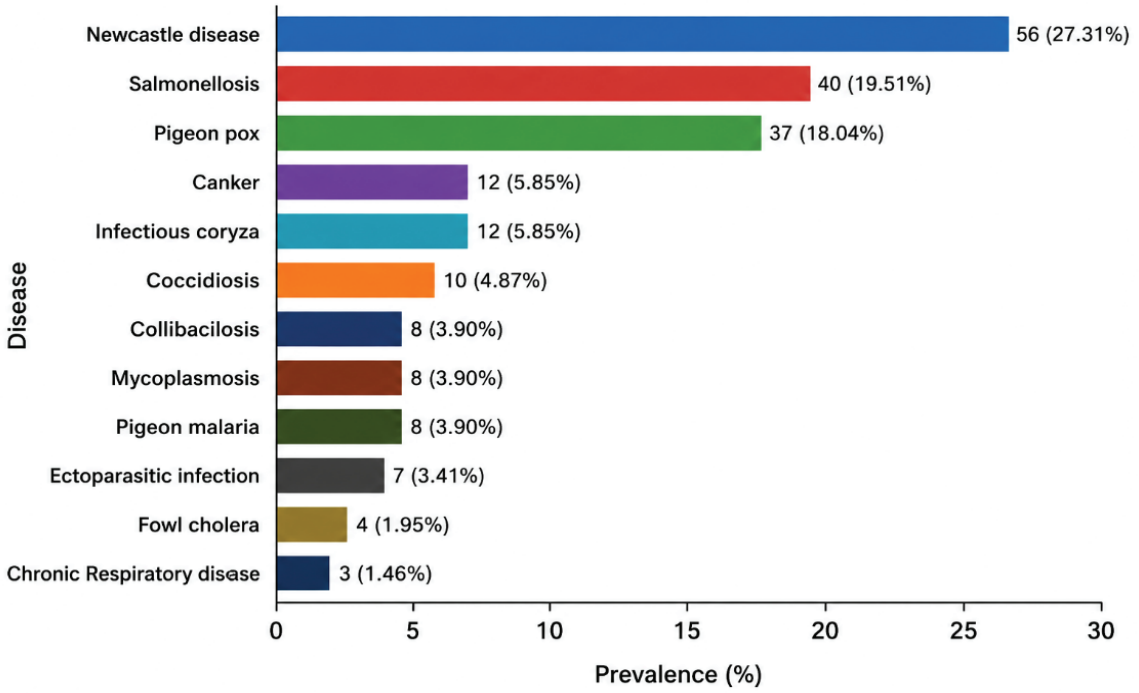


Figure 3. Disease prevalence in commercial pigeon farms (n=100)

these reports were on small scale free range or home raised pigeons, but not in commercial pigeon farming system.

Economic Performance: Economics of commercial pigeon farming in selected areas of Bangladesh is depicted in Figure 4. Economic consideration is a big issue for pigeon farming in the country. Most of the farmers (88%) had an initial capital between 7000 and 50000 BDT. Although farmers had to spent a huge amount of money to operate pigeon farms like permanent costs (housing costs) and running costs (feeds, medicines, labors etc.), however, most of the farmers (68%) earned a net profit of 5000-10000 BDT per month and other (32%) got net profit of 10001-60000 BDT per month. In his study Kabir (2013) found a profit of 2000 BDT from each pair of pigeon in commercial farm. Although not in commercial enterprise, Asaduzzaman *et al.* (2009) conducted a survey on status, problems and prospects of pigeon farming using a pre-tested interview schedule in rural small scale free range or home raised pigeons. Their results revealed housing cost, height of house, duration of house, quantity of feed supplied to each pigeon/day, male female ratio, marketing age, weight, price of squab, number of squab/pair of pigeon, production of squab/year/pair of pigeon, price of each pigeon and mortality of pigeon were 113.33 BDT, 3.50 month, 5 years, 34.50 g, 1.07, 26.66 days, 258 g, 51 BDT, 1.67, 19.53, 113.33 BDT and 6.67%, respectively.

The market instability in pigeon farming in Bangladesh—comprising squab production, fancy pigeon breeding, and homing/racing pigeons—is driven by interconnected economic, biological, and structural challenges. Central to this instability are unregulated open-air markets without standardized pricing, quality grading, and formal processing, leaving producers heavily reliant on middlemen dependence (Asaduzzaman *et al.* 2009). Biological risks further compound these market fluctuations; seasonal disease outbreaks trigger severe mortality spikes, precipitating panic-driven distress sales that flood the market and collapse local prices (Paul *et al.* 2016). Compounding these challenges are volatile feed costs, speculative pricing structures for fancy breeds, and a persistent lack of institutional and veterinary support across the country.

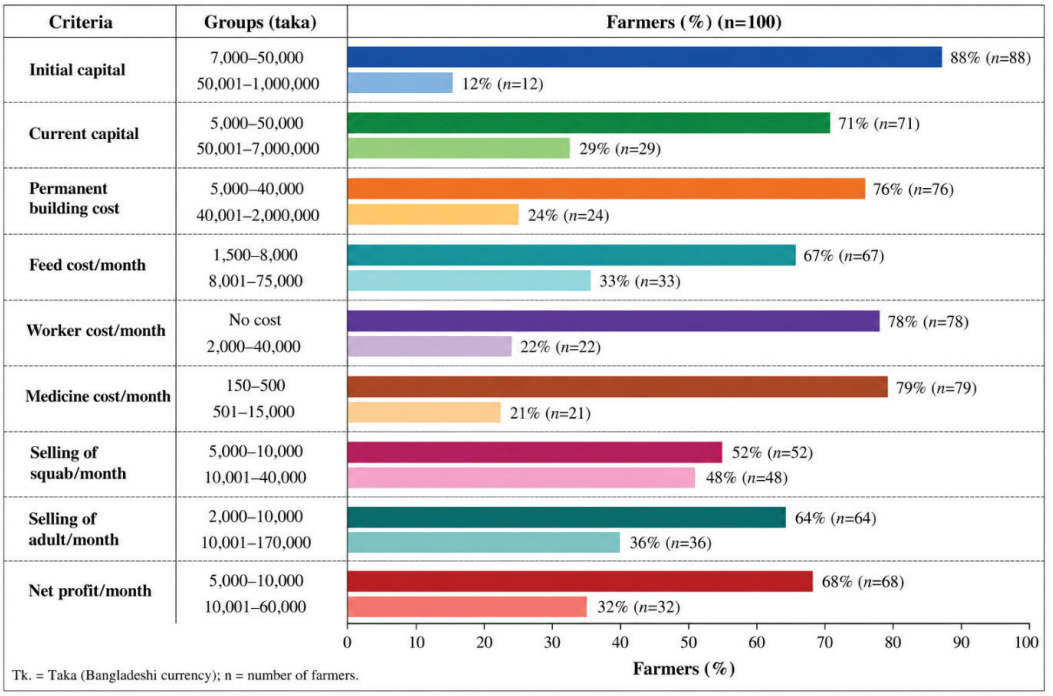


Figure 4. Distribution of farmers according to investment, production costs, income sources, and profitability indicators in commercial pigeon farms in Bangladesh (n=100)

Conclusion

Recognizing the enormous potentiality of commercial pigeon farming, both fancy pigeon as well as squab production to supplement chickens in providing gainful employment, supplementary income and as a valuable source of meat, pigeon farming should be encouraged and promoted in Bangladesh. However, the present study has explored the real status and major constraints of commercial pigeon farming in selected areas of the country which brought about many challenges to the researchers, academicians and practicing veterinarians to adopt all the strategies to make pigeon farming economically and commercially viable in near future in Bangladesh.

Acknowledgements

Sincere acknowledgement is extended to Research Management Committee of Gazipur Agricultural University (RMC Project No. UGC/RMC/48, 2015-2016 and UGC/RMC/38-Section 7, 2016-2017) and University Grants Commission, Bangladesh (2016−2017), for financial assistance.

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