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A COMPREHENSIVE STUDY ON PIGEON FARMING PRACTICE AND BIOSECURITY MEASURES IN NARSINGDI DISTRICT, BANGLADESH

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Abstract

Pigeon farming is gaining popularity rapidly because of the high demand for its squab. It is among the safest meat sources. People of any age can raise pigeons as a hobby and for supplementary income. The purpose of this study was to investigate the pigeon farmer's biosecurity measures and methods of raising pigeons. Due to the availability of pigeon farms, the experiment was conducted in several villages of Raipura Upazila in the Narsingdi district area, including Ramnagar, Paharkandi, Sapmara, and Mohespur. Through group discussion, a variety of data were gathered, and descriptive statistics were used for analysis. Data was obtained from nine different intensive and semi-intensive pigeon farms, focusing on the number of birds, their sources, feeding habits, disease prevalence, vaccination practices, and biosecurity measures. The study revealed significant differences ($P < 0.05$) in the number of birds and vaccination frequency between intensive and semi-intensive farming systems, while farmer age and quarantine duration showed no significant differences ($P > 0.05$). Most individuals raise pigeons as a hobby, ornament, and source of partial income. Pigeons in this area are less prone to disease, and the farmers keep their farm's atmospheric condition healthy and cure birds with natural remedies such as lemon, garlic, turmeric, turmeric, Tulsi leaves, and neem leaves. It is crucial to give farmers training on raising pigeons, loans for large-scale production, and the government measures required to increase the growth and productivity of pigeon farming.

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Introduction: -

In Bangladesh, many people have long-time engagement in pigeon farming due to the country's favorable climate, vast agricultural land, and developments of housing. Because it involves less effort, care, and management, as well as less food, nutrition, and treatment. Sustainable pigeon rearing has a positive impact on meeting the protein demand, lowering unemployment, and improving the socio-economic status of underprivileged people and people rear pigeons for recreation, hobbies, and as a source of partial income (Asaduzzaman et al., 2012).Pigeons are traditionally raised in intensive or semi-intensive systems in Bangladesh for experimentation, as a hobby, for food, and as a symbol of peace (Sari et al., 2008). The productivity of pigeon farming was stunted by several health

problems and the prevalence of diseases like Newcastle, pigeon pox, and coccidiosis; however, providing optimal nutrition enhances growth and egg production in pigeons (Hoque & Khanom, 2023).

According to the FAO (2008), the term "biosecurity" refers to the application of three components segregation, cleaning, and disinfection that lower the probability of introduction and dissemination of disease pathogens. It is one of the most efficient strategies to prevent the transmission of diseases to other farms through the implementation of biosecurity measures, e.g., cleaning, disinfection, quarantine, isolation, rodent control, movement control, and hygienic practice (Edition, 2022; Mohammed, 2024; Services, 2023). Biosecurity is a collection of management activities that reduce the transmission of disease and causal agents from farm animals to other animals and humans (Akter et al., 2025; İMTİAZ et al., 2024; Msami, 2008).

Pigeon farmers raise pigeons in small-scale scavenging systems with supplemental feed, but they are unaware of pigeon breeds, pigeon diseases, and disease preventive measures (Asaduzzaman et al., 2012; Hoque & Khanom, 2023). There are constraints in raising pigeons in Bangladesh, such as inadequate nutrition, lack of rearing knowledge, pigeon predators, diseases, and poor loft hygiene, which retarded the bird's growth and productivity (M. A. Kabir, 2021). Understanding the feeding, housing, management, and biosecurity guidelines of pigeon rearing is vital to increasing pigeon productivity. Farmers can minimize the usage of medication and reduce the spread of infections by implementing biosecurity measures and performing vaccinations. Thus, the purpose of this research is to understand the biosecurity protocols and pigeon rearing methods used in different farms.

Material and Methods:-

Study Area

The current study was carried out on nine selected pigeon (*Columba livia domestica*) farms in the Raipura Upazila of Narsingdi District, Dhaka Division, Bangladesh between June and August 2020. Four villages from the Musapur and Mohespur Unions Ramangar and Paharkandi, Maniknagar and Sapmara were included in the study. The geographical location of the study area is approximately 23°55′ N latitude and 90°43′ E longitude. With an average ambient temperature of 30°C and relative humidity of roughly 78% over the research period (Ventusky, 2020). Bombaai, Giribaj, Siraji, Lakkha, Homer, and the indigenous Deshi are the main pigeon breeds raised in this area.

Method of Data Collection:-

Farms were purposively chosen to evaluate pigeon rearing practices and biosecurity measures. The study site was selected for its proximity and accessibility during the COVID-19 pandemic. A questionnaire was developed to collect primary data through field visits, open-ended interviews, and group discussions, while secondary data were gathered from relevant literature and unpublished sources. Housing, feeding, cleaning, disinfection, deworming, and pest control were the main areas of observation. Additionally, the aim of group discussions was to enhance farmers' insights into biosecurity procedures.

Data Analysis:-

For this experiment data collected data were recorded on Microsoft Excel and the data were analyzed by calculating mean values, standard deviations, p-values by using RStudio 4.5.1.

Results and Discussion:-

There were significant differences in the number of pigeons and vaccination frequency between intensive and semi-intensive farming systems ($P< 0.05$). In contrast, no significant differences were observed in the age of farmers and the quarantine period of birds ($P> 0.05$), as shown in Table 3.As demonstrated in Figure 1, it is evident that intensive farming had a larger distribution of birds (40-120) with a median of ninety, whereas semi-intensive farming had a smaller number of birds (20-40) with a median of thirty. According to this study both farms are exposed to many diseases, but the prevalence of Newcastle disease is 33%, which is significantly more frequent than coccidiosis and combination of ND and pigeon pox, which is 22%. Conversely, as depicted in figure 2, pigeon pox and coccidiosis solely accounted for 11%. Figure 3 illustrates that during the study period semi-intensive farms used less sanitation, whereas intensive farms endured more disinfectants and potassium permanganate to clean cages and utensils. In this experiment two types of farming systems were observed in the study areas. The intensive farm comprised a high flock size of 40-120, and the semi-intensive farm contained a small number of birds, ranging from 20 to 40. In contrast, Husein et al., (2023) reported the major pigeon rearing system was semi-intensive, with most farmers having populations of about fifty and few farmers having flocks larger than one hundred. In related studies, MTD et

al., (2021) indicated that three types of rearing systems were identified, and these were scavenging, semi-scavenging, and intensive pigeon raising systems. Farmers procured pigeons from the market and gave them as gifts in experimental areas. Customers in Bangladesh have the option to purchase expensive birds for their hobbies, but because of the high cost, they would prefer to acquire less expensive birds (Kabir, 2013). Husein et al., (2023) in his research noted farmers could purchase birds from pigeon farmers and middlemen. Similarly, M. A. Kabir (2018) recommended buying pigeons from a reputable pigeon loft instead of the open market.

Both viral and parasitic diseases were encountered in intensive and semi-intensive pigeon farms during the study. With a prevalence rate of 33%, viral disease ND outperformed the other infectious diseases that were reported, coccidiosis and pigeon pox, with rates of 22.2% and 11.1%, respectively. Pigeon Pox, ND, and pox together contributed 11.1% and 22.2% of cases. In relation to the prevalence of disease, studies by Islam, (2020) viruses accounted for about 66% of diseases in Bangladesh, with bacteria coming in second at 22% and parasitic infections at 11%. This contrasts with the findings of Rahman et al., (2022) which showed a relatively high establishment rate in parasitic infestation (30%) and substantially more common than bacteria (22.3%), viral (18.9%), nutritional factors (16.3%), and fungal infection (15%). Earlier studies by Paul et al., (2016) noted parasitic infestations were about 32% more common than other infections. In the circumstance of vaccination, intensive farms administered vaccines twice in a year, whereas semi-intensive farms performed it once in a year, and few farms did not follow the vaccination program, and the scheduled vaccination chart were followed by farmers listed in Table 1. In addition to biosecurity, immunization is a helpful strategy for disease management, and a well-executed immunization program could efficiently reduce the spread of disease (Journal & Journal, 2007).

In contrast to semi-intensive pigeon farms, intensive farms more regularly follow biosecurity guidelines and implement cleaning, disinfection, and sanitation programs on their farm. M. A. Kabir (2018) explained that effective usage of potash, bleach, and lime decreased the spread of pathogenic organisms and parasitic infestations in related investigations. Standard biosecurity principles and disease prevention techniques are either unknown or poorly understood by pigeon farmers. When cleaning and disinfecting the farm and removing litter, they did not use personal protective equipment (Asaduzzanab, 2018). Pigeon raised in semi-intensive environments are typically allowed to scavenge food from natural resources. Paddies, wheat, and mustard are occasionally given to them as a supplementary feed. Conversely, intensive farms were provided with rations made up of the ingredients listed in Table 2. According to Adawy & Abdel-Wareth (2023), a pigeon's food intake is equivalent to one-tenth of its body weight. It is also recommended to remove pigeon peas from the diet since they contain a neurotoxin that causes paralysis (Adawy & Abdel-Wareth, 2023). Farmers use germinated grams to ration pigeons in exchange for vitamin E, which increases egg fertility. They employ grit and chicken eggshell as a calcium supply, which significantly affects the quality of the eggshells. Neem leaves are traditionally kept in the pigeon loft as a means of controlling mites and maintaining a clean atmosphere.

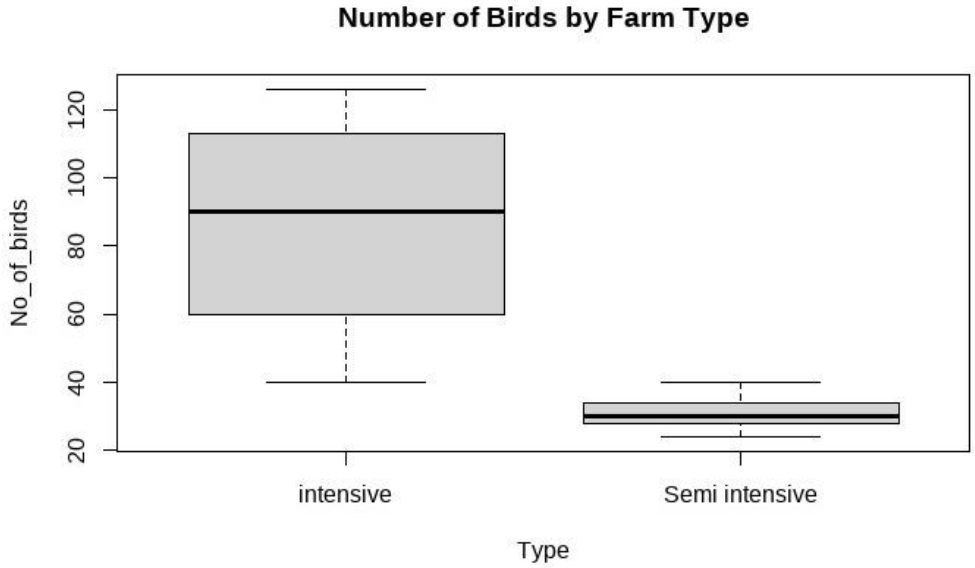

Figure 1:- Graphical Representation of No of Birds in Study area.

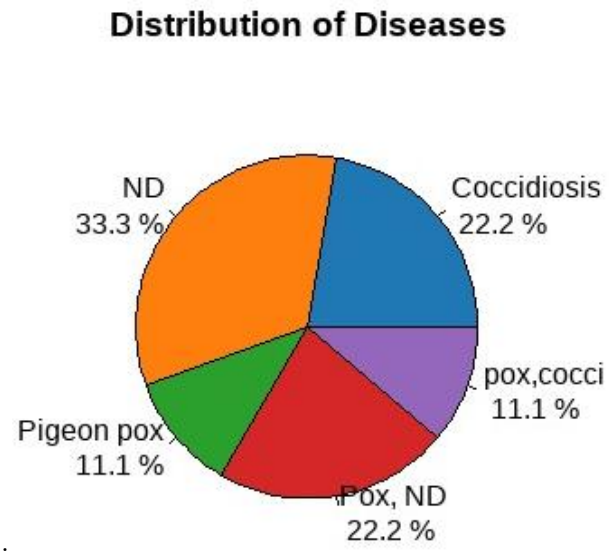

Figure 2:- Graphical Representation of Diseases distribution on Study area.

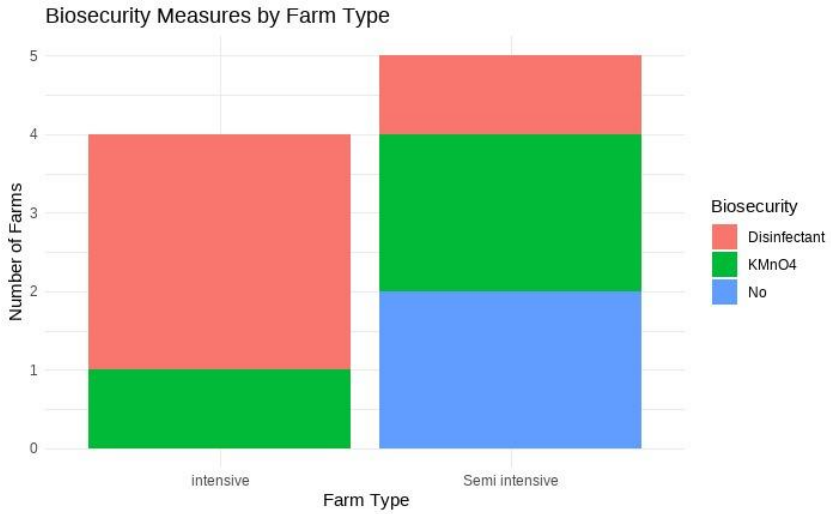

Figure 3:- Graphical Representation of Biosecurity Measures Taken in Study farm.

Table 1:- Vaccination Schedule for Pigeon Farm.

Age of birds (Age)	Name of Vaccine	Route of Administration	Dose
1st	Mareks	S/C	0.2 ml
7th	BCRDV	Intra ocular	1 drop one eye
15th	ND	S/C or IM	0.3ml
25th	Pigeon Pox	Wing wave method	
35th	Fowl typhoid	S/C or IM	0.3ml
55th	Infectious coryza	S/C	0.3ml
65th	ND Booster	S/C at Neck	0.3ml
75th	Fowl cholera	S/C	0.3ml
105th	Infectious coryza (Booster)	S/C	0.3ml

Source: (Welfare, 2003).

Table 2:- Feed used in study farm.

Name of Ingredients	Percentage (%)
Wheat	50

White Peas	20
Paddy	13
Maize	7
Mix pulse	1.5
Peanuts	2
Sunflower Seeds	2
Grit	2
Mustard	1
Salt	1
Oyster shell	0.5
Total	100

Table 3:- Management characteristics of semi-intensive and intensive poultry farms.

Attributes	Semi-intensive (Mean ± SD)	Intensive (Mean ± SD)	P value
Farmer Age	31.33 ± 11.64	35.75 ± 6.65	0.56
Number of birds	31.00 ± 6.16	86.50 ± 36.44	0.053
Vaccination times	0.83 ± 0.41	2.00 ± 0.00	0.003
Quarantine (days)	7.00 ± 0.00	9.75 ± 2.22	0.076

Conclusion:-

The younger population in Bangladesh has recently been more interested in pigeon farming to earn money, pass the time, and compete in pigeon races. Two types of farming system were practiced in experimental area and there is significant effect of farm type on number of birds and vaccination times. Most pigeon raisers purchase their birds from local markets and usually have no training or skills in pigeon farming. Due to inadequate management practices, the absence of immunization programs, and numerous infectious and non-infectious diseases, significant economic losses frequently arise. To enhance productivity and profitability in the pigeon farming sector, governmental support through training programs and microcredit facilities for small-scale farmers is necessary. We attempted to inform the pigeon farmer about biosecurity-related guidelines and pigeon farming methods during our group discussion.

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Questionnaire

Sl. No.	Biosecurity Parameter	Standard value
1.	Farm Location	
2.	Minimum distance should be maintained from Poultry farm =200M	Yes/No
3.	Minimum distance from residential area = 500M	Yes/No
4.	Minimum distance from live bird markets = 1000M	Yes/No
5.	Minimum distance from waste dumping area = 1000M	Yes/No
6.	Minimum distance from water body pond, lake = 1000M	Yes/No
7.	Minimum distance from Garden and Large tree Plantation = 200M	Yes/No
8.	Minimum Distance from wild bird =100M	Yes/No
9.	Minimum distance from road =25M	Yes/No
10.	East West Direction of shade and cages	Yes/No
11.	Fence around the farm	Yes/No
12.	Lockable gate	Yes/No
13.	Birdproof Nettings	Yes/No
14.	Height of the roof =1M	Yes/No
15.	Overhang of roof	Yes/No
16.	Rodent proof	Yes/No
17.	Wild bird proof	Yes/No
18.	Distance between sheds=12M	Yes/No
10.	Storeroom	Yes/No
20.	Rodent free storeroom	Yes/No
21.	Bird disposal	Yes/No
22.	Visitor Registrar maintain	Yes/No
23.	Use of protective clothing	Yes/No

24.	Foot bath at entrance	Yes/No
25.	Disinfectant spray at entrance	Yes/No
26.	Hand wash at entrance	Yes/No
27.	Floor clean daily	Yes/No
28.	Feeder and waterer clean daily	Yes/No
29.	Plastic trays clean	Yes/No
30.	Water purification	Yes/No
31.	Quarantine of bird buy from market	Yes/No
32.	Isolation of sick bird	Yes/No
33.	Carcass disposal	Yes/No
34.	Vaccination in farm	Yes/No
35.	Washing cage after sell bird	Yes/No
36.	Cleaning equipment	Yes/No
37.	Sanitation	Yes/No
38.	Waste disposal	Yes/No
39.	Rodent control program	Yes/No
40.	Wild bird control system	Yes/No
41.	All in all, out system	Yes/No