

## Chapter I: Introduction

Broodiness is the action or behavioral tendency to sit on a clutch of eggs to incubate them, often aligned with the non-expression of many other behaviors including feeding and drinking. Being broody has been defined as "Being in a state of readiness to brood eggs that is characterized by cessation of laying and by marked changes in behavior and physiology". These include not be in her usual active and curious mood, camped out in nest, get very defensive, make a unique growling sound "clo-clo-clo" even along with aggressive pecking and feather erection while approached by intruders. Broodiness is usually associated with female birds, although males of some species become broody. Broodiness is more common in some chicken breeds than others, indicating that it is a heritable characteristic. Broodiness is triggered by hormones, daylight, and the availability of eggs to sit on. When a hen is broody, it means her maternal instincts have kicked in. Her hormones are surging and telling her it's time to sit on and hatch some eggs. There's no exact science as to what makes a broody hen – it's a combination of hormones and instinct. But the hormone prolactin, secreted from the anterior lobe of the hypophysis is thought to be mainly responsible for the character "Broodiness". This also provokes egg laying to stop within a few days, vitellum reabsorption and ovary regression (hens only have a left ovary in hens. Attempts to stop broodiness by the administration of several hormones have failed because this state, once evoked, requires time to revert. A hen while brooding, pluck its feathers from chest to cover the eggs. As a consequence of this, they develop one or several patches of bare skin on the ventral surface. These reddish, well-vascularized areas of skin are usually called brood patches which improve heat transfer to the eggs while incubating.

It's hard to predict when a hen will go broody, but generally young hen does not go broody during their first laying season. Hens are most likely to go broody in the spring as the warm weather is a signal to them to hatch and raise chicks. It's much rarer for hens to go broody during the winter in colder weather. While a hen is broody it sits on a nest even when there are no eggs. She will put all her energy into sitting on eggs and neglect herself in this process. She will only leave the nest to eat, drink, and relieve herself once or twice a day. She will become pale, lose sheen in her feathers and weight. The comb and wattles of the broody hen also become pale. In hot weather, she can easily become dehydrated. At the same time, she will not lay any eggs, and may inspire other hens in the flock to go broody as well. Broodiness begets broodiness. They prefer small, dark, private areas where they can snuggle

up in the nest and incubate eggs. The droppings of broody hen are unusually large and extremely smelly. Broody hen clucks softly to her chicks as they get close to hatch day. A broody hen will continue brooding until she hears the little peeps of baby chicks. Otherwise, she will sit on eggs indefinitely. This can have a seriously negative impact on the health of a mother hen.

However, despite of these drawbacks, the character “broodiness” is considered to be a vital compartment in birds specially for those in the forest. We can’t imagine the well-balanced eco-system of the ornithes in the nature without it. For the farmers at the remote area where there is no hatchery and who do not have the facility of incubating eggs through incubators are mostly relied on the broody hens. Broody hens are also imperative tool of reproduction for the farmers who reared birds that do not possess the character “broodiness”.

In Bangladesh, most of the farmers who reared local poultry through backyard farming are typically count on broody hens to hatch their fertile eggs whether collected from hen, duck or turkey. The socio-economic status of the farmers is also somewhat responsible for their dependence on broody hens that do not costs money. Moreover, in the rural areas uninterrupted electricity throughout the day is seldom to see. Even there are some remote areas where this facility is yet to reach due to the topography. So, almost all the backyard poultry farmers of Bangladesh are hatching their day-old birds using broody hens. Though this natural incubation system is practicing from the very beginning of the poultry farming history of Bangladesh and till now a considerable percentage of the farmers here are following this, there is no systematic study on the behavior, productivity and economic importance of these broody hens. So, our study was aimed to assess the detailed behavioral activity, productivity and economic importance of broody hens in Bangladesh (specific area).

## **Chapter II: Materials and methods**

### ***2.1. Study area and agro-climate***

The study was conducted in three different upazila of Sherpur, Mymensingh, Bangladesh. The upazilas are Sherpur Sadar, Jhinaigati and Sribordi. The climate of the study is classified as warm and temperate. Sherpur district is bounded on the north by India, on the east by Mymensingh district, on the south and west by Jamalpur district. The summers are much rainier than the winters. Ceramic soil is the main natural resource of this district. The annual average temperature of this district varies from maximum 33.3 °C to minimum 12 °C. The annual rainfall is 2174 mm.

### ***2.2. Study design***

A cross-sectional survey was conducted in the three upazila's of Sherpur using a structured questionnaire for a period of 3 months from 15<sup>st</sup> July to 15 October, 2021.

### ***2.3. Household selection***

Total 40 households were selected from 3 different upazila of Sherpur district. The households were interviewed by walking door to door from the entrance to the end of the village until the sample size was reached. A chicken household was surveyed selected based on the following criteria like five year of experience for chicken rearing, currently owning at least two adult broody hens and one cock, free family labor and surrounding scavenging lands for free scavenging of chickens (perceived from pilot study), no objection of the family members for chicken keeping.

### ***2.4. Farmer's interview***

One interviewer (fourth year veterinary students from CVASU under supervision of CVASU academician) was trained in surveying and interviewing techniques at CVASU. Farmers were interviewed in their own premises. In order to get in depth, the interviewer interviewed only two farmers per day. It took around two hours to interview a respondent. A break of 30 minutes was taken between two subsequent interviews. An observation list was also completed during the farm visit. Institutional approval for conducting interviews with the households was obtained from CVASU.

### ***2.5. Data collection***

Data were collected through face to face interview. Before, the field survey, a structured questionnaire (Appendix I) and a survey protocol were developed to achieve targeted objectives for the chicken households. After briefing the objectives of the interview, verbal and written consents of the respondents were taken. The questionnaire included observational checklist, age of the interviewee, socio-economic status of the interviewee, flock size, demography, housing systems, feeding system, age at first laying, annual egg production from full flock, clutch size, pause size, sale and consumption of meat. Many of the farmers replied the questions of interviewer in colloquial language. As a result, audio recorder and head note were used to record the information during each interview.

## Chapter III: Results

### 3.1. Socio-economy of the chicken farmer

The mean age, land size, homestead area and annual income of the broody hen owners were 34 years, 0.33 acre, 0.04 acre and 1240 \$USD, respectively. All of them were women and housewife (Table 1).

**Table 1.** Socio-economic condition of the broody hen owners (N=40)

Variable	Socio-economic indices <sup>†</sup>					
	Min	Max	Mean	SE	95% CI	
					Lower	Upper
Age of the farmer (year)	23.0	50.0	34.0	1.22	31.5	36.5
Land size (acre)	0.16	1.10	0.33	0.03	0.27	0.39
Homestead area (acre)	0.01	0.13	0.04	0.04	0.03	0.04
Annual income (10×\$USD)	706	259	124	64.0	111	137

<sup>†</sup>Min = Minimum, Max = Maximum, SE = Standard error, CI = Confidence interval

### 3.2. Flock structure

The mean flock size obtained in the current study was 10.4. And the average no. of broody hen within the households was 6.6 (Table 2).

### 3.3. Age at 1<sup>st</sup> lay

The study showed that the starting of laying eggs of a hen ranged from 150 days to 195 days and the average age of first laying of a hen was 177.3 day. The laying cycle per hen was also found 5.2 per year (Table 2).

### 3.4. Clutch size

The lowest clutch size (no.) found through the study was 12.0 and the highest were 15.0. And the average no. of the clutch size was 13.4 (Table 2).

### 3.5. *Pause size*

The minimum pause size found from the study in the laying period was 45 days and the maximum pause size was 60 days and the average pause size was 54.4 days (Table 2).

### 3.6. *Annual egg production*

The study showed that the annual egg production per hen ranged from 55 to 90. The average annual egg production by a hen was 74.0 (Table 2).

### 3.7. *Brooding period, hatchability, egg weight and mortality*

The brooding period was 23.5 day and the hatchability was found 79.2%. The egg weight was 40.8 g and the mortality of chicken was 20% (Table 2).

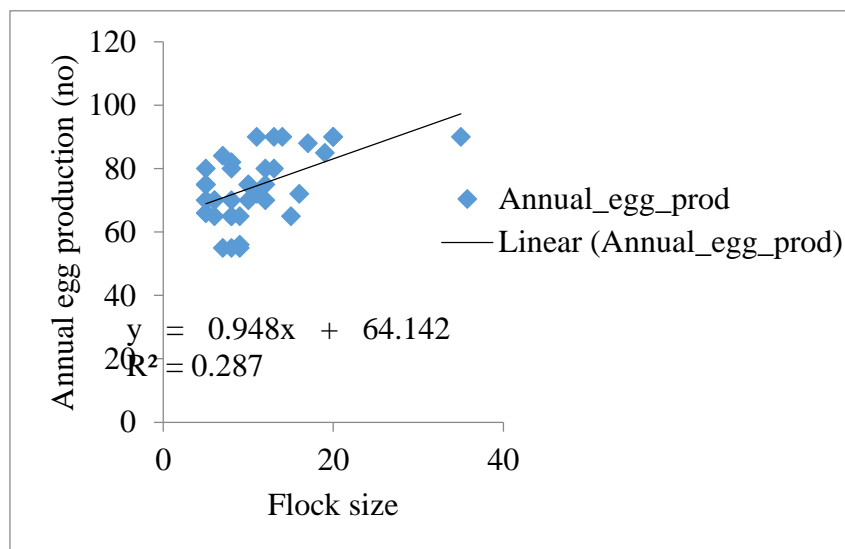
**Table 2.** Overall performance of the broody hen (N=265)

Variable	Performance indices <sup>†</sup>					
	Min	Max	Mean	SE	95% CI	
					Lower	Upper
No. of broody hen	2.00	20.0	6.60	0.56	5.50	7.80
Age at 1 <sup>st</sup> lay (day)	150	195	177	1.40	174	180
Pause size (no)	45.0	60.0	54.4	1.00	52.4	56.4
Clutch size (no)	12.0	15.0	13.4	0.16	13.1	13.8
Brooding period (day)	22.0	25.0	23.5	0.12	23.2	23.7
Laying cycle per year (no)	4.00	6.00	5.20	0.10	5.00	5.40
Annual egg production (no)	55.0	90.0	74.0	1.60	70.7	77.4
Egg weight (g)	38.0	45.0	40.8	0.31	40.2	41.5
Hatchability (%)	70.0	90.0	79.2	0.95	77.2	81.1
Mortality (%)	10.0	30.0	20.0	1.2	17.6	22.4

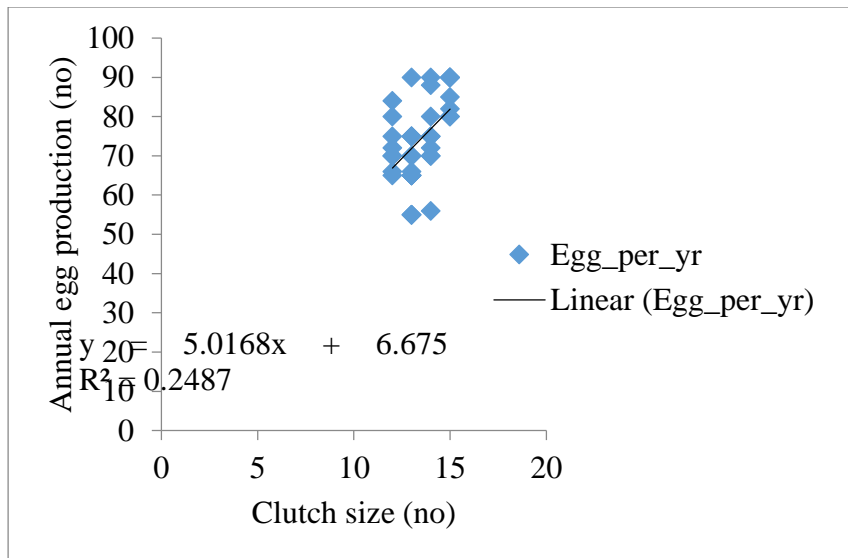
<sup>†</sup>Min = Minimum, Max = Maximum, SE = Standard error, CI = Confidence interval

### 3.8. Production, sale and consumption

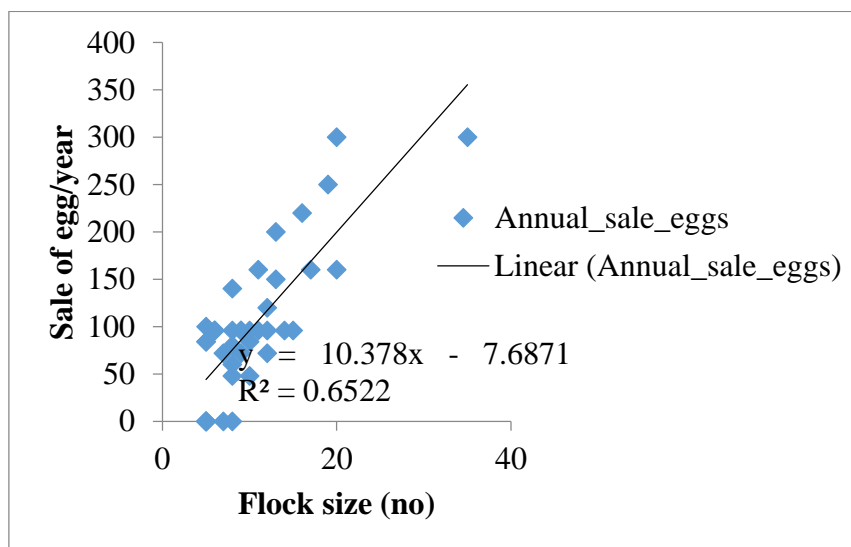
The market age of a male and female was 4.7 month and 4.5 month respectively and the market weight of male and female was 0.8 kg. The market price of cockerel was 338.5 (BDT/kg) and the market price of pullet was 316.8 (BDT/kg). The annual consumption of egg was 74.9 and chicken was 3.4. The annual sale of egg was 100.5 and chicken was 5.1. An increased flock and clutch size was associated with increased annual egg production (Figure 1-2) which ultimately increased annual egg and chicken sale and consumption (Figure 3-7). Further, an increased annual egg production concomitantly increased annual income (Figure 7). Interestingly, an increased pause size substantially decreased annual egg production (Figure 8).



**Figure 1.** Association between flock size and annual egg production (N=265)

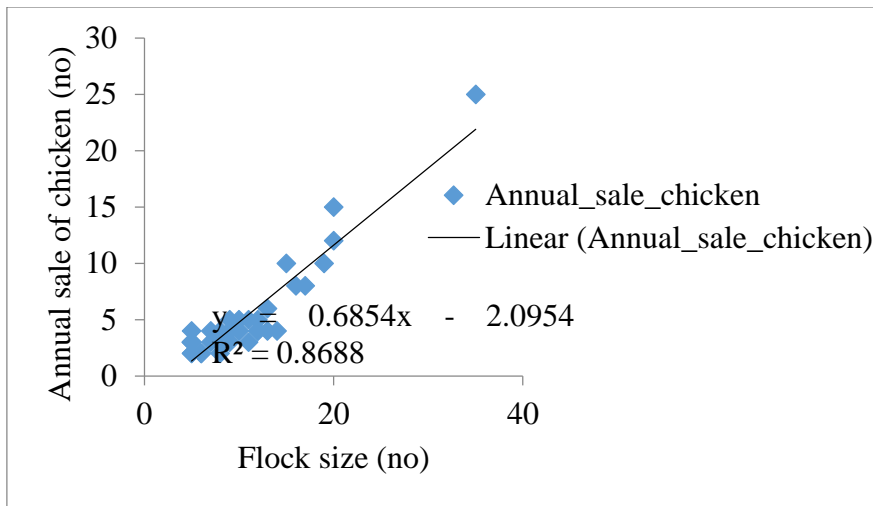


**Figure 2.** Association between clutch size and annual egg production (N=265)

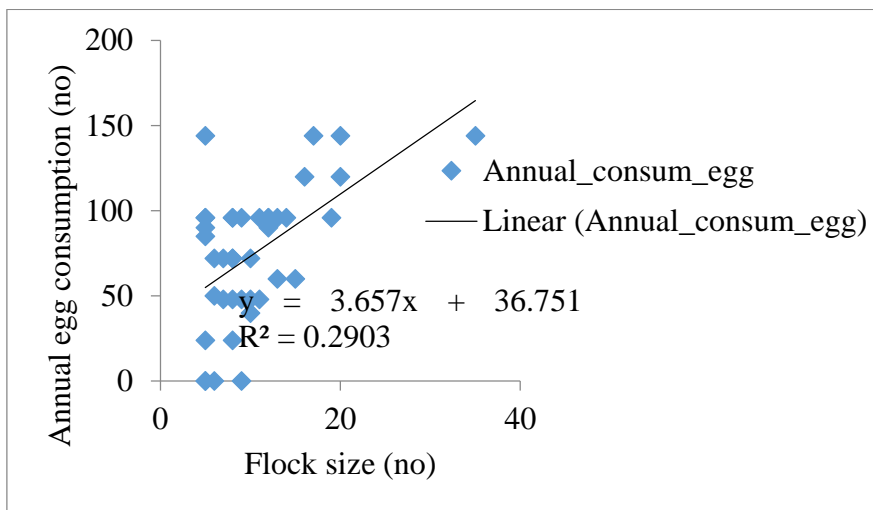


**Figure 3.** Association between flock size and sale of egg/year (N=265)

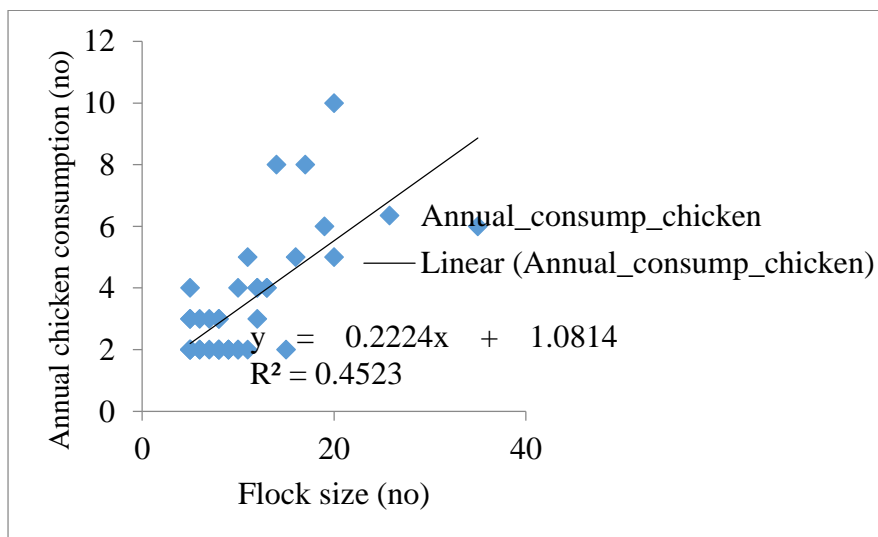




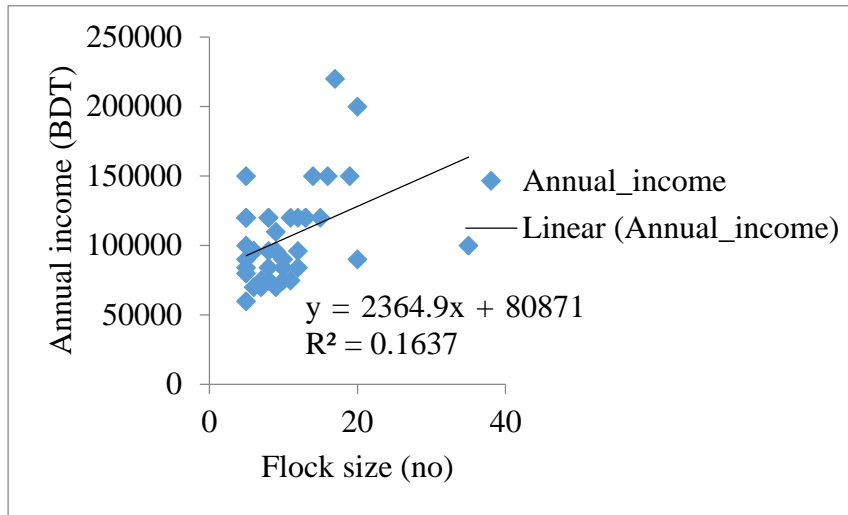
**Figure 4.** Association between flock size and sale of chicken/year (N=265)



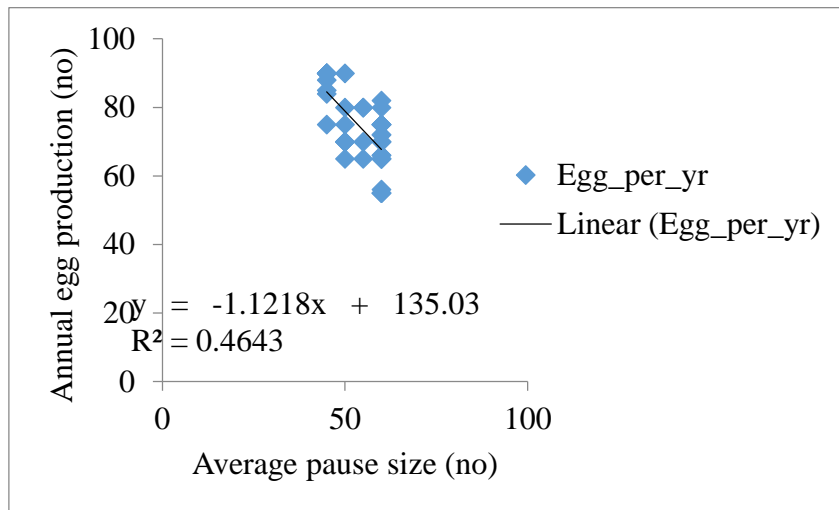
**Figure 5.** Association between flock size and egg consumption/year (N=265)



**Figure 6.** Association between flock size and annual chicken consumption (N=265)



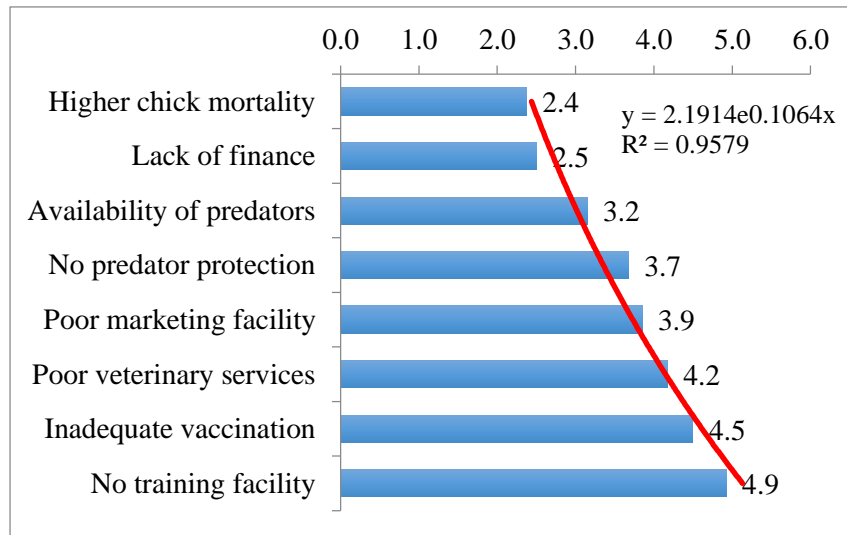
**Figure 7.** Association between flock size and annual income (N=265)



**Figure 8.** Association between average pause size and annual egg production (N=265)

### 3.9. Challenges

Higher chick mortality was the most challenging issue followed by lack of finance, availability of predators, no predator protection, poor marketing facility, poor veterinary services, inadequate vaccination and no training facility respectively for raising broody hen in the study areas (Figure 9).



**Figure 9.** Challenges of raising broody hen (N=265)

## **Chapter IV: Discussion**

### ***4.1. Socio-economy of chicken farmer***

The study was carried out in three different upazilas of Sherpur district, Bangladesh. The respondent farmers of the study were of different ages but most of them were around the age of 34.0 year. In a previous study, Achakzai et al., (2019) reported that the majority of the farmers rearing broody chicken were >40 years which resembles the findings of present study. In another study, Singh & Jadoun, (2014) reported that the mean age of the broody hen rearers was <30 years. All of the farmers of our study were women and housewife which is fully in accord with previous study Singh & Jadoun., (2014). As the underprivileged rural people start a new family, the unemployed family women look for some sources of additional income to bear expenses of their daily foods, clothing, medication and children's schooling Hossain, (2020). Hence, broody hen rearing is considered as one of the most important methods of generating additional income for the rural women. In present study the annual family income of the farmers ranged from 705.9 to 2588.2 \$USD and the average income of the farmers was 1241.5 \$USD which was quite similar with the findings of (Singh et al., 2014) which implies that the people of medium to low annual income are more involved in broody hen rearing.

### ***4.2. Flock structure***

The mean flock size obtained in the current study was 10.4. Comparatively higher flock size was reported in a previous study (Islam et al., 2021) where overall mean flock size was  $29.79 \pm 0.28$ . The reasoning behind the very high difference was the purpose of chicken rearing was to meet day to day petty expenses (49.50%) and self-consumption (24.50%) and the flocks were mostly comprised of chicks (Islam et al., 2021). In contrary, Islands., (2017) found that chicken flock was dominated by adults followed by growers and chicks in Solomon Islands. In general, the difference in flock size might be attributed due to season, culling, disease outbreak and predation (Moges et al., 2010). Flock size and management practices of indigenous village chickens vary considerably within and across the regions (Sambo et al., 2015) since chickens are kept by the diverse group of farmers in terms of their socioeconomic status. Broody hen rearers usually raise chickens of both sexes, various ages with assortments of various plumage color and morphological characteristics (Laenoi et al.,

2015). Since the hens of the neighboring households roam together, they breed among themselves which bring various plumage patterns in the subsequent generations.

#### ***4.3. Age at 1<sup>st</sup> lay***

The average age at first lay of the broody hens obtained in the present study was 177.3 day which supports the findings of a previous study (Singh et al., 2004) where the average age at first lay was reported to be 180 day. However, this result differs with Thakur et al., (2012) where the average age at first lay was 240-270 day. Mostly the birds were left for scavenging in the open fields. None of the family was providing any nutritional supplementation to the birds. Average housing space for a single bird was comparatively lower. These features indicate poor welfare measures which prolonged the age at first laying. (Thakur et al., 2012). The study of (Shahjahan et al., 2011) had a similar findings with the present study where the ages of first laying was 180-185 days as their feeding and management protocol was good. According to Dutta., (2013) age at first laying was observed earlier in hen of Rajshahi district. This might be due to the scavenging habit, which makes the indigenous chicken environmentally more adapted (Dutta et al., 2013). In a previous study (Atela et al., 2016) the results showed that sexual maturity was attained at the age of 6 months for both male and female chicken, though the chicken attained maturity earlier in terms of age at first laying probably because they use commercial feeds to supplement their chicken.

#### ***4.4. Clutch size***

The average clutch size of the broody hen observed in the study areas was 13.4 (N=265). Closely similar result was reported in a previous study by Jahan et al., (2011) where the average clutch size was  $12.03 \pm 0.11$ . It might be due to the variation of genetic merit among the types of birds or feeding and other management could be affected (Jahan et al., 2017). Peter & Atela.,(2016) reported 16.0 as the mean clutch size which is little bit higher than the present study. The performance variables were much lower for those of free range production system compared to semi confined and confined chicken (Atela et al., 2016).

#### ***4.5. Pause size***

The average pause size estimated in the present study was 54.4 days. The pause size for domestic broody chicken was 121.6 d reported in a previous study by Kumar et al. (2016)

which is pretty much higher than the present study findings. The involvement of nutritional factors and genetic diversity implies improvement in egg number with retention of broodiness character (Kumar et al., 2016). Pause sizes per year were highly dependent on feed, water, care and husbandry of laying hen, because this hen had to brood and take part in husbandry process of her baby chicks up to a certain age (Jahan et al., 2017).

#### ***4.6. Annual egg production***

The study showed that the average annual egg production of the broody hens in the selected areas of Sherpur was 74.0 (N=265). The result appears similar with the findings of Thakur et al. (2012) where average annual egg production was 83. Some more previous studies are also in accord Pampori and Iqbal (2008) where the average annual egg production varied from 50-60. However, reported better in the chicken reared in better managerial conditions with an average of 75 to 90 eggs per year. May be the development of urbanization and socio economy of respondent farmer had a vital effect on higher egg production in recent years. In a previous study by Pampori and Iqbal (2008) reported that the average annual egg production of the broody hens was 60. The result of his study revealed that there is a need for serious intervention in disease control activities so as to improve village chicken production and productivity of the broody hen.

#### ***4.7. Sale and consumption of egg and meat***

The indigenous chicken was reared both for egg and meat production as well as a source of family income. The chickens were sold as live chicken mostly when they needed cash. Majority of the farmers sold their chickens to the neighbors, hawkers and to the other people who need chicken meat for weddings, birthday parties and other celebrations. Farmers rarely sold their chicken at market might be due to higher transportation cost (Abdelqader et al., 2007).

In this study the average number of annual sale of eggs and chicken was found 100.5 and 5.0 respectively in Sherpur district. The average number of annual consumption of egg and chicken stated in our study was 74.9 and 3.4 respectively. The indigenous people reared native chickens in their home traditionally to meet household expenses. They had no ideas of commercialization for raising native chicken other simply taking it an integral component of their subsistence farming system (Karmaker et al., 2018).

A previous study by (Kumar et al., 2013) reported that most of the surplus males (59.38%) are sold before one year of age, whereas females are less commonly culled or sold (21.87%) which had comparable findings with the present study. It was discovered that as high as 52.15% of the eggs and 59.38% of the cockerels produced are consumed in the home. When sold they attract at least a two-fold higher price compared to birds of industrial origin (Kumar et al., 2013). The study of Mengesha et al. (2008) revealed that the overall percentage of households were using primarily body weight (34.2%) followed by plumage color (33.4%) and comb type (32.4%) in judging the price of chicken in the market which had similarities with this study. According to the respondents, there was a price fluctuation in the study areas and about 40.0% respondents reported that chicken price fluctuation was due to purchasing power of the consumers (Mengesha et al., 2008). Raising backyard poultry in rural Bangladesh provides important income and nutrition with an excellent Return on annual investment. Income from backyard poultry flocks accounted for 2.8% of monthly household income. Return on annual investment (ROI) per flock was 480%. Yearly, median family consumption of eggs was one-fifth of the total produced eggs and three poultry from their own flock (Shanta et al., 2017) which resemblances with this study.

#### ***4.8. Brooding period, hatchability, egg weight and mortality***

The average brooding period was 23.5 days in the present study. As the brooding period increases, the annual egg production subsequently decreases. Hence, it was argued that egg production of the broody hen could be improved simply by minimization of broodiness through changing the location and bedding of the hen during brooding or by consumption or sale of all of eggs (Pampori and Iqbal, 2008). In a previous study, Kumar et al., (2016) obtained 26.03 days mean brooding period, egg weight 40.74, hatchability 79.05% which resembles with our study but the mortality reported 26.67% which was slightly higher than this study. Predators and disease prevalence might cause the mortality higher. According to Health et al., (2007) hatchability(%) was  $83.1 \pm 1.60$  and survivability (%) was  $71.4 \pm 1.80$ . Hatchability and survival rate were strongly correlated with the improved management score of the households (Abdelqader et al., 2007). In Lao PDR, chick mortality averaged 75%, considerably higher than the level in adults which ranged from 25 to 35% (Bouahom et al., 2007); the majority of losses in chicks were ascribed to predators which resembles with the present study.

## **Chapter V: Conclusion**

An increased flock and clutch size of the broody hen increases the annual egg production which ultimately increases the annual egg and chicken sale and consumption. Further, an increased annual egg production concomitantly increases annual income. Interestingly, an increased pause size substantially decreases annual egg production.



## Chapter VI: References

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## Appendix-I

### Brooding behavior, performance potentials and socio-economic impact of backyard chicken in Bangladesh

#### Owner's details

Name: ..... Age: ..... Sex: M / F Mobile No: .....

Address: .....

Educational backgrounds of farmer:

None <input type="checkbox"/>	Primary <input type="checkbox"/>	Secondary <input type="checkbox"/>	More <input type="checkbox"/>
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Land size:

Homestead: .....acre

Agricultural land:  Small (0.51-1 acre)  Medium (1-2 acre)  High (> 2 acre)

Occupation: ..... Annual income (Family): ...../year

What are the main reasons for your chicken rearing?

- i. Cash income/ eggs consumption/ meat consumption/ hobby/ others.....

#### Flock description

- i. Flock size: .....Cock: .....Hen .....
- ii. Source of chicken: Own/Market/Neighbors
- iii. Market age and weight of male
- iv. Reasons of marketing at that age: .....
- v. Market age and weight of female
- vi. Reasons of marketing at that age: .....
- vii. Current market price of male
- viii. Current market price of female
- ix. Marketing system: Own/Foria/Bepari
- x. Color preference for customer: Yes/No
- xi. Which color is most preferred?
- xii. What do you do with very old spent hen?

#### Housing system

- i. Rearing system: Free range/Intensive/Semi-intensive/Other.....
- ii. Elements of house: Bamboo/straw/tin/polyethylene with bamboo/Brick cemented/wood/Soil/others....
- iii. Location of chicken house: Next to the house Near the scavenging area
- iv. Availability of scavenging area: Yes/No
- v. Share houses with duck: Yes/No
- vi. Cleaning of shed: Daily/Weekly/Monthly/Other.....
- vii. Litter used: Yes/No If Yes: Ash/sand/ash and sand both/others.....
- viii. Ventilation facilities: Yes/No

ix. Have any isolation facilities: Yes / No

**Feeding system**

- i. Type of feeding: Natural/commercial/both.
- ii. Name of ingredients: Mixed feed/Boiled rice/Paddy/Broken rice/Free scavenging.....
- iii. Give any commercial feed? Yes/ No. If yes: .....
- iv. If scavenging, what type of feed? .....
- v. Feed for chicks: .....
- vi. Additional feed for laying hen: Yes/No Type.....
- vii. Frequency of feeding: 1 Time/2 Times/More
- viii. Duration of scavenging for broody chicken per day: .....hours
- ix. Brooding time per day:.....hours
- x. Deduction in feed intake: Yes/No

**Disease management**

- i. Any diseases occur in previous/current? Yes/ No. If Yes.....
- ii. Regular vaccination: Yes/ No If yes, type of vaccine: .....
- iii. Regular deworming: Yes/ No
- iv. If yes, type of anthelmintic: .....
- v. Mortality rate of chickens: .....
- vi. In which age mortality is higher: 0-2 weeks/ 2-9 weeks/ >9 weeks

Sign	Possible diagnosis	Time	Treatment	Mortality

**Information on laying and brooding behavior**

- ii. Age at 1<sup>st</sup> laying: .....
- iii. No. of egg produced per laying cycle (NOT YEAR)
- iv. No of laying cycle per year
  - v. Average pause size
  - vi. Average clutch size
- vii. No. of days spent for brooding
- viii. No. of egg produced per year
- ix. Approximate egg weight
  - x. Average no. of eggs set for broody hen to get day old chicks: .....
  - xi. Average egg hatched to become chicks: .....
  - xii. Hatchability: .....
- xiii. No. of days spent to start next laying
- xiv. What happen if all eggs are sold from broody hen?
- xv. Does she still sit on for brooding?

- xvi. Plumage color differences on frequency of brooding?
- xvii. Do broody hens exclude unfertilized egg at the later stage of brooding?
- xviii. Incubation period for egg hatching:
- xix. Candling practiced? Yes / No If yes, which method used?
- xx. Fate of unfertilized eggs:
- xxi. Is broodiness seasonal?
- xxii. In which month it is more frequent?
- xxiii. Does broody hen lay eggs during brooding? Yes/No If yes, how many?
- xxiv. Hatchability of broody hen affected with the increase of age: increased/decreased
- xxv. What changes do you notice during brooding period?
  - Changes in feed intake.....
  - Changes in droppings.....
  - Picking out own breast feather.....
  - Changes in body weight.....

### **Vices of broody hen**

- i. What sort of vices do you notice for your broody hen?
  - Frequently leaves the nest
  - Breaks the eggs
  - Eats the eggs
  - Does not brood at the later stage
  - Does not care the chicks
  - Does not protect the chicks from predator
  - Does not help chicks scavenging
  - Does not show aggressiveness for the visitors
- ii. What do you think are the specific causes of above vices?
- iii. What measure do you take to prevent following vices:
  - Frequent leave of the nest
  - Egg breaking
  - Egg eating
  - Not brood at the later stage
  - Does not care the chicks

### **Information of income**

- i. Annual egg production per hen: .....
- ii. Egg production per year from full flock: .....
- iii. Annual consumption of eggs: .....
- iv. Annual consumption of chicken: .....
- v. Annual sale of eggs: .....
- vi. Annual sale of chicken: .....
- vii. Income from selling eggs/year: .....
- viii. Income from selling birds/year: .....
- ix. Total income/year: .....
- x. Total cost/year: .....
- xi. Total profit: .....

**Tell me about the main PROSPECTS of broody hen rearing**

<b>Reasons</b>	<b>Ranking</b>
Sale of chickens	
Sale of eggs	
Consumption of chicken eggs	
Consumption of chicken meat	
To create an extra source of income	
Others.....	

**If predator exists, what do you think are the main predators in your area?**

<b>Name of the predators</b>	<b>Ranking</b>
Mongoose	
Crow	
Jackal	
Wild cat	
Kite	
Dog	
Snake	
Thief	
Others.....	

**What do you think are the main ITEMS YOU NEED for your successful broody hen multiplication?**

<b>Name of needs</b>	<b>Ranking</b>
Adequate scavenging area	
Adequate feed supply	
Good quality Hen	
Good quality eggs	
Proper Vaccination and deworming	
Protection from predator	
Other (specify).....	

**What do you think are the main CHALLENGES for your broody hen production?**

<b>Name of challenges</b>	<b>Ranking</b>
Lack of finance	
Higher chicks mortality	
Inadequate veterinary service	
No training on chicken production	
Poor marketing facility	
Predators	
Natural calamity	
Other (Specify).....	

## **Acknowledgement**

Inestimable praises, thanks and admiration goes to the Almighty Allah, the beginning and the end of everything, for His infinite mercies, loving kindness and divine favor towards me. to conduct this research work for the fulfillment of the requirement for the degree of Doctor of Veterinary Medicine (DVM).

The author gratefully expresses his deepest sense of gratitude, sincere appreciation and insightful respect to his honorable supervisor Prof. Md. Emran Hossain, Department of Animal Science and Nutrition, Chattogram Veterinary and Animal Sciences University (CVASU) for his scholastic guidance and encouragement in all phases of this study and preparing the manuscript.

The author would like to express his heartfelt sense of gratitude and thanks to Prof. Dr. Mohammad Alamgir Hossain, Dean, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University (CVASU) for arranging this type of work as compulsory part of the internship program.

The author would like to express his deep sense of gratitude and heartfelt appreciation to Prof. Dr. A. K. M. Saifuddin, Director, External Affairs, Chattogram Veterinary and Animal Sciences University (CVASU) for the provision of this unique internship program and research exposure.

The author is ever indebted to his parent, brothers, sisters, friends and other relatives for their sacrifices, blessing and encouragement to get him in this position.



## **BIOGRAPHY**

The author, **Md. Mahfuzur rahman**, Son of Md. Motaleb Ali and Mursheda parvin was born on January 25, 1997 at Sherpur sadar, Sherpur. He passed his Secondary School Certificate (SSC) Examination in 2012 (GPA-5.00) followed by Higher Secondary Certificate (HSC) Examination in 2014 (GPA-5.00) from Dhaka board. He is now enrolled in year-long internship programme for completion of Doctor of Veterinary medicine in Chittagong Veterinary and Animal Sciences University (CVASU), Chattogram, Bangladesh. In future he would like to do Research work about animal welfare, epidemiological study and Zoonotic diseases those take public health significance in the world regarding one health constitution.