Original Research Article

Broiler Farming in Hathazari Region, of Bangladesh: A Study of Management and OutcomesPractices.

Abstract

Broiler farming has greatly contributed to improvingimproved the socio-economic status of people in underdeveloped countries like Bangladesh. The productivity and profitability of broiler farming largely depend on good management practices. The present study was conducted on selected broiler farms to know about the socio-economic status of the farmers, the managemental practices adapted adopted by them and the overall production performance of the broiler chicken in Hathazari region, Chittagong. The data for this study was collected by using direct interview interviews to with farmers, visual inspection of farms and farm records through a pre-formed questionnaire. Through In the study, it was found out that most of the farmers are of young ageyoung (60%), started the farm with their own money (60%), received no training (90%), has had an experience of 6-10 years (50%) and has taken farming as a main occupation (70%). Considering management practices, 50% of the farmers collected day oldday-old chick (DOC) from Kazi Farms Limited through local dealers. The housing system was intensive, open-sidedopen-sided with kacha (60%) and paka (40%) floors and tin shed roof. In all farms, sawdust was used as litter material in study region due to the unavailability of rice husk. Electric An electric brooding system was done used in all the farms with a duration of 5-7 days in summer and 10-15 days in winter. andAbout 50% of farmers reported that they did not measured monitor nor measure air temperature during brooding. Most of the farmers used feed of from the Kazi brand (30%) followed by Paragon (20%), ACI (20%), Aman (10%) and Nourish (10%). Broilers were reared for 28-35 days. The most common disease in this area is Infectious infectious Bursal bursal disease (66%). Most farmers maintained vaccination schedules but hygiene condition conditions were minimal, with no foot bath and unrestricted public access. All the farmers used different growth promoters, antibiotics, liver tonics, and vitamins in broilers. The average mortality rate of the studied farm was 3.36%, the average final body weight was 1.7 kg and the average feed conversion ratio (FCR) was 1.26. It is concluded that the information gathered through this study would be beneficial in developing enhanced poultry management strategies in the study area.

Keywords: Broiler, production performance, mortality rate, day old chick, feed conversion ratio.

Commented [AJ1]: Are these the major feed producers in Bangladesh? If not, why did you only consider the feeds from these feed producers. You need to explain the reasons in the methodology.
In addition, You don't need to report this in your abstract. This result should be well detailed in the result section.

Commented [AJ2]: Not necessary in the Abstract if it does not provide comprehensive information.

1. Introduction

The poultry sector is has developing developed as one of the most promising commercial sectors in Bangladesh in recent years. It contributes 14% to the overall economic value of livestock [30] and 37% of the total animal protein in Bangladesh [27]. The total poultry population is 3857.04 lakh in 2022-23 which is the highest among the previous years [23]. It is estimated that per year per capita consumption of broiler meat was 6.3 kg in 2018 which was assumed to reach 7 kg in 2020 [15]. So the demand for broiler chicken which is mainly produceis mainly produced for meat purpose purposes is increasing day by day due to its shorter production cycle, tenderness, high palatability and digestibility and low price [21].

In recent years poultry industry has experienced a positive transformation evolving from backyard rearing to fast growing commercial sector. A study done on the effect of the

Smallholder Livestock Department Project showed that the socio-economic condition of the people of rural ~~area~~ areas ~~specially~~ especially the meat and egg consumption rate~~.~~, employment rate improved due to the measures taken by SLDP (smallholder livestock department project) [3]. About more than 6 million job opportunities are created by the poultry industry [7]. Thus facilitating in reducing unemployment problems, improving ~~socio- economic~~socio-economic ~~condition~~ conditions also expanding ~~the women~~ women's empowerment in ~~the~~ rural areas [28]. A great number of rural women are under the non-government organization and department of livestock service conducting poverty alleviation ~~program~~ programs which include poultry production and rearing [23]. The poultry sector also created great investment ~~opportunity~~ opportunities in Bangladesh [14]. So the poultry sector has become one of the great ~~source~~ sources for earning, reducing poverty [10]. It has also a greater contribution ~~on~~ to the GDP of the country, thus contributing 1% of the total GDP of Bangladesh [12]

Broilers are young ~~chicken~~ chickens of either male or female reared for meat production. They are characterized by rapid growth gaining a weight of 1.5-2 kg from around 40 gm within 5 weeks. So ~~for achieving~~achieving profits from the poultry industry, one should have good knowledge and more concern on its technical aspects like housing, breeding, feeding and overall management. Like layer birds, broiler also need similar housing with one square feet floor space per bird after they are brought from hatcheries as day old ~~chick~~chicks. As they grow quickly, they require high protein, ~~vitamin~~vitamins, minerals and ~~other trace element~~other trace elements in their diet. According to [6], probiotics in the diet of ~~broiler~~ broilers ~~has~~ have a great effect on their body weight gain, mortality rate and feed conversion ratio. Again feed conversion ratio was greater ~~of~~ for those birds kept under bio-secured ~~condition~~ conditions than those without bio-security [5]. However, the percentages of farmers using lime water to disinfect their farms in Jessore and Bhola were 43.08% and 63.46% respectively [20]. Bangladesh has ~~a~~ suitable weather for rearing ~~broiler~~broilers. But most of the broiler farm ~~owner~~ owners suffer from different problems like lack of capital, ~~over~~ price and low quality of the chicks, high feed cost which is also low in quality, improper transportation system, and ~~Inadequate~~ inadequate veterinary services [22]~~.~~ ~~Study~~ Studies found that the high price of ~~the~~ broiler feed is one of the important factors affecting broiler farms [11,13]. Environmental factors like ~~weather,~~ temperature also affect the growth of the broilers. ~~Beside~~ Besides this broiler faces a lot of diseases like infectious Bursal disease (Gumboro), Newcastle disease (Ranikhet Disease), Avian Influenza, salmonellosis and many more which lead to high mortality [31]. Most of the diseases ~~occurs~~ occur due to managemental problems ~~in~~ on the farm as most of the farmers are illiterate and ~~having~~ have no training or experience ~~on~~ in broiler farming. ~~But~~ However according to a study in Jessore and ~~Bhola~~ Bhola, 40.38% of farmers had been vaccinated against three ~~disease~~ diseases Ranikhet, Gumboro and infectious bronchitis ~~whether~~ while 36.64% of farmers vaccinated the birds against Gumboro and Ranikhet only [20]. Moreover, worldwide the broiler industry including Bangladesh ~~adapting~~ adopting new strategies and technologies ~~in order to~~to improve managemental ~~system~~ systems and production performance.

A good number of research have ~~been occurred~~occurred in different ~~region~~ regions in Bangladesh on broiler production and management. However, no research was found on the management and production aspect of broiler farms in the Hathazari region of Chittagong which has great geographical significance due to ~~it's~~ its rich agricultural land and abundant water resources from the Halda river. Therefore, the current study was undertaken in the Hathazari upazila of Chittagong to minimize this research gap by achieving the following objectives:

~~1)~~ (i) ~~T~~to know the socio-economic status of the farmers of the Hathazari region, ~~.~~

Commented [AJ3]: This content is not contributing to the story you are trying to develop here. It has no link with the previous context. Therefore, if you intend to keep it, I would suggest you restructure it and let it flow with the previous sentence.

Commented [AJ4]: What contribution has this text made? What exactly has the weather conditions contributed here? You need to expatiate further to show what the weather conditions do and how it affect broiler production in Bangladesh.

Commented [AJ5]: I would suggest you restructure these texts. There is an inconsistency in the texts. It is difficult to understand what you are passing across.
Kindly restructure it.

~~2)~~ ~~T~~(ii) to assess the different managemental ~~system~~ systems ~~adapted~~ adopted by farmers in the Hathazari region~~,~~ ~~.~~

~~3)~~ ~~T~~(iii) to assess the production performance of broilers in the Hathazari region

2. Materials and Methods

2.1 Study area

This study was conducted at some selected broiler farms ~~of~~ in the Hathazari ~~upazila~~ Upazila of Chattogram district, Bangladesh.

Figure 1: Location of study area

2.2 Study period

The information related to broiler farming was collected from February~~,~~ 2024 to March~~,~~ 2024.

2.3 Study design

The study design is a retrospective descriptive study.

Commented [AJ6]: You need to indicate the exact location where the study was carried out so that the readers can understand the details of the villages since you did not cover all the villages in the Hathazari Upazila

Formatted: Left

Commented [AJ7]: In addition to the months that the study was carried out, you need to indicate if the study was carried out in batches, weekly or other details that will help the readers to understand the period further.

Commented [AJ8]: Short statements do not provide detailed information. As a result, I would suggest you have a general sub-title for the short pieces of information and then explain all the details under one sub-topic

2.4 Study population

The study was conducted on broiler farms with a flock size ranging from 500 to 3000 birds in ~~hathazari~~ Hathazari ~~upazila~~Upazila. By maintaining this criteria data were collected from 10 randomly selected broiler farms.

Commented [AJ9]: For better understanding, would it be possible for you to provide what prompted you to select the farms? Why the farms? The distance apart, the conditions you have used to help you select the farms.

2.5 Data collection

The data were collected through ~~the~~ direct ~~interview~~ interviews ~~of~~ with the broiler farmers and also by direct ~~visit~~ visits to the farm. A Questionnaire was designed for data collection which contained both open and ~~close~~ closed forms of ~~question~~questions. The data were collected from the owner, their family members and the workers by asking different ~~question~~ questions ~~in simplest way~~. In addition, a farm record book was used, when available, for validation of this information. All the data were collected according to the management systems of the farms. The data were collected on different ~~parameter~~ parameters like —owner's information (Name, age, occupation, experience and whether received any training or not), management system (No. of birds, type of housing, floor and litter management, brooding, feeder and drinker, biosecurity and hygiene practices, common disease and drug used and vaccination schedule) and finally on production performance like feed conversion ratio (FCR), mortality rate and final body weight.

~~FCR~~ FCR $= \frac{Total\ feed(kg) consumed\ up\ to\ the\ age\ of\ marketing}{Live\ weight\ (kg) of\ bird\ at\ the\ age\ of\ marketing}$

~~Mortality rate~~ Mortality rate $= \frac{Total\ death\ till\ marketing}{Total\ DOC\ introduced\ in\ farm} \times 100$

~~Final body weight gain~~ Final body weight gain $=$ $live\ weight\ of\ bird\ at\ marketing\ day - day\ old\ chick\ weight$

2.6 Statistical analysis

The collected data was ~~entered~~ processed ~~into~~ using Microsoft ~~excel~~ Excel 2016 ~~and sorted accordingly~~ for further analysis. Descriptive statistics including mean value, frequencies and percentages were calculated using ~~excel~~ Excel formula. For various qualitative variables, the Fisher's Exact test was performed using STATA-11 software.

Commented [AJ10]: We are in 2025, why are you still using 2016 software?

3: Results

3.1 Owner's information

~~The~~ Detailed information about the owners~~' information like name, age, sex, experience in this field, received any training or not~~ are presented in Table 1. Most of the farmers (60%) invested ~~from~~ their own ~~fund~~funds. ~~Majority~~ The majority of them did not receive any training (90%; p = 0.001). No female broiler farm owner was observed in the study area. A great ~~number~~ percentage (60%) of them are between the age of 24 to 30 years~~are young (60%) individuals aged between 24-30 years~~. About 50% of the owner ~~has~~ had an experience of 6~~-~~ to10 years and a considerable number of them have taken farming as their primary occupation.

Table 1: Information about the status of broiler farms' owners (N=10).

Parameter	Categories	No. of farmers	Percentage (%)	p-value (Fisher's Exact)

Investment source	Own	6	60	0.656
	Bank loan	4	40	
Received any training	Yes	1	10	0.001
	No	9	90	
Age (year)	24-30	6	60	0.090
	31-35	2	20	
	36-40	2	20	
Sex	Male	10	100	-
	Female	0	0	
Experience (year)	1-5	3	30	0.118
	6-10	5	50	
	11-15	1	10	
	16-20	1	10	
Farming main occupation	Yes	7	70	0.178
	No	3	30	

3.2 Managemental practices in broiler farms

3.2.1 Collection of day ~~-~~old chick and no. of birds:

The farmers collected the ~~day old~~day-old chicks (DOC) from different companies like Kazi farms, Paragon, CP, Nahar etc. in the Hathazari region. They collected the DOCs through the local dealers of particular hatcheries. ~~Size~~ The size of the observed farms and the source of DOCs are presented in Table 2. Among the ten (10) farms three ~~small scale~~small-scale (30%), five ~~medium scale~~medium-scale (50%) and two large ~~scale~~ scales (20%) farms were seen. ~~&~~ ~~most~~ Most of the DOCs (50%) ~~are~~ were ~~brought~~ obtained from the Kazi farm in that area.

Table 2: Size of farms and source of DOC.

Parameter		**No. of farmers**	**Percentage (%)**	**p-value**
Farm size	Small (500-1000 birds)	3	30	0.349
	Medium (1000-2000 birds)	5	50	
	Large (2000-3000 birds)	2	20	
Source of DOC	Kazi Farm	5	50	0.111

	Paragon	2	20	
	Aman	1	10	
	Nourish	1	10	
	Dhaka group	1	10	

3.2.2 Housing system

All ten broiler farms are of intensive type with tin shed ~~roof~~roofs. Large and ~~medium scale~~medium-scale farms had separate brooder and grower ~~shed~~sheds. But in ~~small scale~~small-scale farms, there was a single shed used for both brooding and growing ~~purpose~~purposes. ~~Housing~~ The housing system of ~~our~~ the selected farms ~~are~~ is shown in Table 3 which reveals that most farms had kacha ~~floor~~ floors (60%) ~~&~~ and the majority of farmers used tarpaulin as curtain to protect their birds from adverse weather.

Table 3: Housing system of farms.

Parameter		**No. of farms**	**Percentage (%)**	**p-value**
Floor type	Kacha	6	60%	0.656
	Paka	4	40%	
Curtain type	Sack	4	40%	0.656
	Tarpaulin	6	60%	
Floor space/bird at the grower stage	1-1.5 Sq. ft	5	50%	_
	1.5-2 Sq. ft	5	50%	

3.2.3 Feeder and drinker

In most ~~of the~~ farms, tray ~~feeder~~ feeders are used during brooding (some farmers avoid it as it causes more ~~wastages~~ wastage of feed) and round ~~feeder~~ feeders after brooding. ~~Feeder~~ Feeders are wiped daily with a clean cloth and washed per batch. Drinkers are washed three times per day. Water was supplied directly from deep ~~well~~ wells in most farms. ~~No.~~The number of feeders and drinkers ~~are~~ is presented in Table 4 ~~shown~~ showing that during brooding 6 farms used 1 feeder and drinker per 100 ~~bird~~birds. At growing stage, 6 farms (p = 0.057) kept 3-4 ~~feeder~~ feeders for every 100 birds which indicating a significant difference in feeder distribution.

Commented [AJ11]: How is this achieved and why wash the drinkers 3 times a day?

Table 4: No of feeder and drinker in farms.

Period of flock	**No. of ~~feeder~~feeders/100 bird**	**No. of farm**	**p-value**	**No. of ~~drinker~~ drinkers/100 bird**	**No. of farm**	**p-value**
Brooder	1	6	0.656	1	6	0.656

	2	4		2	4	
Grower	1-2	3	0.057	1-2	4	0.142
	3-4	6		3-4	5	
	5-6	1		5-6	1	

3.2.4 Brooding management

The brooder house was prepared before the arrival of the chicks at the farm using rice husk as litter material and plastic board as chick guard. In most farms, 500 chicks were brooded together except some in which 300/400/750/1000 were brooded together. The duration of brooding was 5-7 days in summer and 15-18 days in winter.

No significant differences can be figured out on brooding temperature measurement and the number of bulbs used for brooding from Table 5. Half of the farms maintained the brooder temperature schedule by keeping the temperature scale in the brooding area whereas half of the farms did not maintain that.

Table 5: Temperature measurement and No. of bulb used during brooding.

Parameter		**No. of farms**	**p-value**
Brooding temperature	Measured	5	-
	Not measured	5	
No. of bulb used/ brooding	3-5 of ~~100 watt~~100-watt/500 bird	5	-
	6 of ~~100 watt~~100-watt/ 500 or 750 bird	5	

~~No significant differences can be figure out on brooding temperature measurement and no. of bulb used for brooding from the Table 5. Half of the farms were maintaining brooder temperature schedule by keeping temperature scale in brooding area whereas half of the farms did not maintain that.~~

3.2.5 Litter management

Sawdust was used as litter material in all farms due to scarcity of the rice ~~husk~~ husks in the Hathazari region. A study in Bangladesh investigating the impact of various liter materials on broiler performance concluded that sawdust was most effective for promoting broiler growth (Monira et al., 2003). The depth of the liter was thicker in cold season than summer. The depth was 1-1.5 inch in most farms in summer season; in some farms it was 2-2.5-inch depth. In cold season the depth ~~was~~ is usually 3 ~~inch~~ inches in most farms.

3.2.6 Feeding management

Effective feed and feeding management is a primary concern for successful commercial poultry farming. ~~Feed~~ The feed should contain all of the nutrients like protein, fat, carbohydrate

Formatted: Space Before: 12 pt

Commented [AJ12]: Do you mean wood shavings? Using sawdust for poultry litter could result in respiratory problems. Kindly verify this information so that you won't mislead the readers.

Commented [AJ13]: Kindly restructure this text.

~~vitamin~~vitamins, and minerals for proper growth of broilers. All the farmers of the study area used feed from different companies like Kazi, ACI, Paragon etc.

Table 6: Feed, feed type and feeding schedule adapted by different farmers.

Feed ~~company~~Company	**Farm no. (%)**	**Feed type**	**Feed size**	**Time**
Kazi	3 (30%)	Broiler starter	Crumble	0-15 days
		Broiler grower	pellet	15-till marketing
ACI	2 (20%)	Broiler starter	Crumble	0-14 days
		Broiler grower	Pellet	14- till marketing
Paragon	2 (20%)	Broiler starter	Crumble	0-15 days
		Broiler grower	Pellet	15-till marketing
Suguna	1 (10%)	Broiler starter	Crumble	0-20 days
		Broiler finisher	Pellet	20-till marketing
Aman	1 (10%)	Broiler starter	Crumble	0-17 days
		Broiler grower	Pellet	17-till marketing
Nourish	1 (10%)	Broiler pre-starter	Crumble	0-8 days
		Broiler starter	Crumble	9-20 days
		Broiler finisher	Pellet	21- till marketing

3.2.7 Common disease and medication

~~Prevalence~~ The prevalence of different ~~kind~~ kinds of ~~disease~~ diseases ~~were~~ was seen in all broiler farms. ~~Outbreak~~ Outbreaks of ~~Infectious~~ infectious ~~Bursal~~ bursal disease (Gumboro) and Newcastle disease (Ranikhet) were seen in some of the farms which caused high mortality and great loss to the farmers. ~~Beside~~ Besides these, ~~Brooder~~ brooder pneumonia, ~~Chronic~~ chronic ~~Respiratory~~ respiratory ~~Disease~~disease, ~~Ascites~~ascites, ~~Infectious~~ and infectious coryza were also seen in different farms.

From Table 7, it can be observed that infectious bursal disease (66%) is the most prevalent disease in that region followed by Newcastle disease (44%). Various kinds of medicine were used by farmers in the brooding and growing stages of broilers. In the brooding stage, Cefa-1 Vet (Cephalexin), Lisovit (anti-stress drug), and different vitamins and minerals like Zinc, Calcium, selenium etc were given to the birds. Glucose and amino acid preparations were used. In the growing stage, different antibiotics like Sulpha drug, amoxicillin, Colistin, Enrofloxacin, Amprolium etc. were used. Toxin binder, liver tonic, and different vitamin-mineral preparations were also used to enhance the growth of broilers.

Commented [AJ14]: This establishes the earlier comment I made. The prevalence of respiratory problems, in addition to other problems, could be as a result of sawdust used as litter material

Table 7: Disease prevalence in different ~~farm~~farms.

Name of Disease	No of Farms	Prevalence (%)
Infectious bursal disease (IBD)	6	66%
Newcastle Disease (ND)	4	44%
Chronic Respiratory disease	4	44%
Infectious Coryza	3	33%
Brooder Pneumonia	1	11%
Ascites	1	11%

~~From Table 7 we can see that infectious bursal disease (66%) is the most prevalent disease in that region followed by Newcastle disease (44%). Various kind of medicine are used by farmers in brooding and grower stage of broilers. In brooding stage Cefa-1 Vet (Cephalexin), Lisovit (anti-stress drug), different vitamin and minerals like Zinc, Calcium, selenium etc. Glucose and Amino acid preparations are used. In growing stage different antibiotics like Sulpha drug, amoxicillin, Colistin, Enrofloxacin, Amprolium etc. are used. Toxin binder, liver tonic, different vitamin mineral preparations were also used to enhance the growth of broilers.~~

3.2.8 Vaccination schedule

Most of the farmers maintained the proper vaccination schedule whereas some of them had vaccinated their chicks for 2- to 3 ~~time~~times.

Commented [AJ15]: You need to talk to the table and not just allow your readers to be the ones to figure out the details of the information in the table.

Table 8: Proper vaccination Schedule maintained by farmers in the study area.

Day	Disease	Vaccine	Dose and Route
3-4	ND	BCRDV	1 drop in 1 eye
7-12	IBD	Gumboro	1 drop in 1 eye
18-20	ND	BCRDV	1 drop in 1 eye
22-25	IBD	Gumboro	1 drop in 1 eye

3.2.9 Biosecurity and hygiene management

Most of the farmers maintained minimal biosecurity in their farms. Farmers and workers used separate shoes and ~~dress~~ dresses to enter ~~into~~ the farms. There was no footbath in any farms. No strict restriction was available to the entry of common people in most of the farms. ~~Vehicle~~ Vehicles carrying feed had their wheels sprayed before ~~enter into~~entering the farms. Proper ventilation ~~were~~ was maintained in most of the farms. Most of the farms had proper drainage ~~system~~ systems to wash out the ~~wastages~~wastage. Dead birds were either buried in the soil or ~~given in the pond as feed~~ fed ~~for~~ to fish or thrown away ~~in land~~into the push. In some farms there were no access to rodents as net were used to prevent their entry whether in some of them had access of rodents like rat. After the marketing of flock at first the litter materials were cleaned properly. Then some farmers washed the shed with bleaching powder and lime while

Commented [AJ16]: What exactly are you saying here? Kindly check the statement and restructure appropriately.

Commented [AJ17]: No meaning. Kindly restructure the text.

some of them washed with potash and lime water. At last the sheds were sprayed with copper sulphate.

3.2 Production performance of the farms

Table 9: Production performance of the 10 studied farms with mortality rate

Commented [AJ18]: There should be a few sentences before the table. You cannot start a subtopic with a table.

Sl no.	Initial Population	Final Population	Mortality Rate (%)	Total feed consumption/Bird (Kg)	Final body weight/Bird (Kg)	FCR
1	3000	2830	5.6	1.6	1.5	1.06
2	2000	1960	2	2.5	1.5	1.6
3	1500	1470	2	2	1.8	1.1
4	1500	1430	4.6	3	1.6	1.8
5	1500	1470	2	2	1.8	1.1
6	1000	995	0.5	2	2	1
7	1000	970	3	2.5	1.7	1.5
8	600	570	5	2	1.6	1.25
9	500	480	4	1.8	2	0.9
10	500	485	3	2	1.5	1.3
Total	**13100**	**12660**	**3.36**	**21.4**	**1.7**	**1.26**

Figure *2*: Mortality rate of 10 farms

Formatted: Left

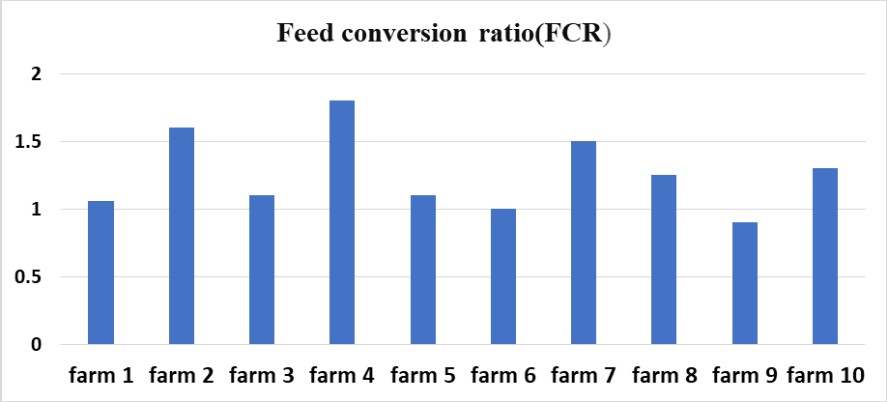

Figure 3: Feed conversion ratio (FCR) of 10 farms

Discussion

The present study revealed that the investment sources of 60% of the farmers were their own money while [17] found that farmers started their ~~farm~~ farms by taking ~~loan~~ loans from Bangladesh Krishi Bank. In the study area, 60% of farmers are ~~of young age~~young (24-30 years) which is contraindicated to the study of [32] that 60% of the farmers are of middle age (~~31-50years~~31- 50 years). [2] also observed that 54.84% of the farmers were of middle age (31-50 years) in Mymensingh. Most of the farmers (50%) had an experience of 6-10 years while 30% of them had experience of 1-5 years. (Islam et al., 2015) found that 75% of Mymensingh and 33.3% of ~~farmer~~ farmers of Barguna had experience of more than 3 years. Only 10% of ~~farmer~~ farmers received training in the study area and 90% got no training. [4] reported that only 27.5 % farmer got training while majority of them (72.5%) got no training. Farming was the main ~~Occupation~~ occupation of 70% farmers while 30% of them ~~taken~~ took it as a secondary occupation or hobby. [26] showed that 35% of broiler farmer had taken farming as main occupation.

In the study area, 50% of the farms were of medium scale while 30% were of small scale ~~&~~ and only 20% of ~~farm~~ farms were of large scale. These findings ~~contradicts~~ contradict the findings of [8] who reported that most of the farms (80%) were of small scale; only 8.3% farmers had medium ~~&~~ and 11.7% farmers had large farms in Botswana. Maximum farmers purchased ~~day~~ day-old chick from Kazi Farms Ltd and this has previously been reported in another study. ~~Which is similar to study of~~ [14]. The flooring system of most of the farms ~~were~~ was Kacha whereas some of them had Paka ~~floor~~floors. [33] reported that most broiler flooring ~~system~~ systems are Kacha and brick in Bangladesh. They suggested that using Kacha flooring because it resulted in higher growth rates and better feed conversion ratio (FCR) compared to other types of flooring [1]. All of the broiler ~~shed~~ sheds in the study region were intensive open-sided ~~type~~ types which ~~has similarity~~is ~~similar with~~ to the study of [19]. Maximum farmers of Hathazari ~~upazila~~ Upazila used the feed of Kazi farms LTD. (30%) which ~~has is similarity with~~similar to [33] in Santhia upazila under Pabna district. Besides this, feed of Paragon, ACI, Aman, and Nourish were also used in the study region. All farmers of the study region used sawdust as litter material due to lacking of rice husk in that region. However, [1] reported that rice ~~husk~~ husks were mainly used by the farmers (60%) in the Sylhet region other than sawdust (28%). Brooding was done with an electric brooder in all of the farms for 5-7

Commented [AJ19]: You need to present the results of these tables and figures. You can not provide them without talking about them.

Formatted: Left

Commented [AJ20]: You need to improve the way you explain your discussion. You have not done it properly. You have good points but the way you discuss your work is like your work is the best and others' works are rubbish. Kindly compare your work properly for others to also reference your work the way you want it to be referenced.

Commented [AJ21]: The reference is not properly cited. E.g. Kchtisi [17] .....

Commented [AJ22]: Your comparisons are not well presented. Since the studies were not conducted in the same region, it is inappropriate for you to criticise the study of other researchers. You can compare your work with other researchers based on the information you have in a region in respect to other region which has reported different results

Commented [AJ23]: Not properly cited. Kindly cite the reference appropriately.

Commented [AJ24]: Wrong referencing

Commented [AJ25]: Wrong referencing style

Commented [AJ26]: Wrong referencing style

Commented [AJ27]: You need to revisit this section. Rewrite it appropriately for readers to understand it.

Commented [AJ28]: Wrong referencing style

Commented [AJ29]: Botswana and Bangladesh are not the same country nor in the same region. Why will you be contradicting the work that was done in another country? You need to discuss your work appropriately.

Commented [AJ30]: Wrong referencing style

Commented [AJ31]: Wrong referencing style

Commented [AJ32]: Wrong referencing style

Commented [AJ33]: Check and correct appropriately

Commented [AJ34]: Wrong referencing style

days in the study area. [19] also reported electric brooding for 7 days in Mymensingh and Barguna district. In the study area, the prevalence of ~~Infectious~~ infectious ~~Bursal~~ bursal disease (66%) & Newcastle disease (44%) were the highest which has similarity with [1]. But [16] reported that salmonellosis was the most prevalent (28.57%) disease while infectious bursal disease & Newcastle disease were the next most prevalent ~~disease~~ diseases affecting 14.87% ~~&~~ and 12.56% of poultry in the Gazipur district. In the study area, ~~vaccine~~ vaccines against infectious bursal disease ~~IBD~~ and Newcastle disease were used and a maximum numbers of farmers maintained proper vaccination ~~schedule~~schedules. [29] reported that 70% of farmers maintained regular vaccination ~~schedule~~ schedules ~~whether~~ whereas 30% of them ~~didn't~~ did not maintain it. [9] reported that 16% of the farmers had done regular vaccination to control disease in the Mansa district of Punjab. In ~~hathazari~~ Hathazari region most farmers ~~didn't~~ did not imposed strict ~~restriction~~ restrictions on the entry of common people and did not ~~kept~~ keep any footbath at the entrance of farms which ~~has~~ is ~~similarity~~ similar ~~with~~ to the findings of [18] that the biosecurity practices in Bangladesh by poultry farmers are quite insufficient like common people can easily enter the farms without properly disinfecting their hand, shoes and ~~cloths~~clothes.

The average feed conversion ratio (FCR) of the study area was 1.26 ~~whether~~ and [35] found the FCR 1.93 to 1.94. The average mortality rate was 3.36% in the Hathazari region but [24] reported 6.2 % mortality in the Hariana region. The final body weight per bird was 1.7 kg which is similar to [1]. But [34] reported a 1.5 kg average market weight per bird in Sherpur Sadar ~~upazila~~Upazila.

Conclusion

~~Broiler~~ The broiler sector has a great role in the improvement of the socio-economic condition of the people of Bangladesh. It has created employment opportunities for the educated young generation and rural women. In the Hathazari region all of the broiler farm owners (100%) are male and most of them are youth of age 24-30 years old. Only 10% of the farmers got training on farming and large number of them (70%) has taken it as their main profession. Intensive rearing was practiced in all farms, with most ~~of~~ the farms (60%) having kacha ~~floor~~floors. ~~Majority~~ The majority of DOCs (60%) and feed (30%) were supplied by Kazi farms. Electric brooding was done in all farms for 5-7 days in summer. Sawdust was used as litter material in that area. Birds were mostly affected by infectious bursal disease (66%) despite most farmers maintaining a proper vaccination schedule in that area. The result of the present study will be helpful for the broiler farmers and researchers to find out the lacking on management system of broilers as well as how to overcome these lacking so that production performance of the broiler increases. ~~Beside~~ Besides this, the government should take the lead in advancing this sector.

The information collected in this study were collected at a time from the farmers. The flock were not observed for full rearing time. Some farmers were not cooperative and showed unwillingness to give information

References

1. Afrin, D., Sarkar, T., Ahmed, M., Khan, M., Marufatuzzahan, M., & Mukta, S. (2019). Study on commercial broiler management pattern in Sylhet region of Bangladesh. *Journal of Entomology and Zoology Studies, 7*(4), 702–708.

Commented [AJ35]: Wrong referencing style

Commented [AJ36]: Wrong referencing style

Commented [AJ37]: Wrong referencing style

Commented [AJ38]: Wrong referencing style

Commented [AJ39]: Wrong referencing style

Commented [AJ40]: Wrong referencing style

Commented [AJ41]: Wrong referencing style

Commented [AJ42]: Wrong referencing style

Commented [AJ43]: Wrong referencing style

Commented [AJ44]: Wrong referencing style

Commented [AJ45]: Kindly restructure this text.

Commented [AJ46]: This should have been presented under the methodology and not here. Kindly move it to its appropriate place and restructure the text as appropriate.

2. Akter, M. S., Uddin, M. T., & Dhar, A. R. (2023). Advancing safe broiler farming in Bangladesh: An investigation of management practices, financial profitability, and consumer perceptions. *Commodities, 2*(3), 312–328.
3. Alam, J. (1997). Impact of smallholder livestock development project in some selected areas of rural Bangladesh. *International Journal of Natural Sciences, 9*(3).
4. Alam, M., Sultana, S., Hassan, M., Hasanuzzaman, M., & Faruk, M. (2016). Socio-economic status of the farmers and economic analysis of poultry farming at Gazipur district in Bangladesh. *International Journal of Natural Sciences, 4*(2), 8–12.
5. Ali, M. Y., Jahan, S., Das, A., & Islam, M. A. (2015). Seasonal influence on productivity and profitability of small and medium scale broiler farming in Bangladesh. *International Journal of Livestock Research, 5*(5), 21–29.
6. Anjum, M., Khan, G., & Afzal, A. (2005). Effect of dietary supplementation of multi-strain probiotic on broiler growth performance. *Pakistan Veterinary Journal, 25*(1), 25–29.
7. Ansarey, F. (2012). Prospects of poultry industry in Bangladesh. *Asian Journal of Poultry Science, 50*, 62–65.
8. Baliyan, S. (2017). Socio-economic factors as determinants of farm management skills among broiler poultry producers in Botswana. *International Journal of Agricultural Economics, 2*(2), 27–34.
9. Bhattu, B., Sharma, A., & Singh, G. (2015). A study on constraints of broiler farming entrepreneurship in Mansa District of Punjab. *International Journal of Computer Applications, 0975–8887*, 24–27.
10. Bhende, M. J. (2006). Production and cost of broiler meat: A case study of Karnataka. Bangalore, India: *Agricultural Development and Rural Transformation Centre, Institute for Social and Economic Change*.
11. Chanjula, P., & Pattamarakha, K. (2002). Betong chicken raising in Southern Thailand: A preliminary survey. *Journal ISSAAS, 8*(2), 14–24.
12. Zonayet, Md., & Paul, A. K. (2020). Study on productivity of jhum crops and post-harvest soil nutrient status by using NPK briquette. *International Journal of Bio-Resource and Stress Management, 11*(4), 361–369.
13. Elsedig, E. A. A., Mohd, M. I., & Fatimah, M. A. (2015). Assessing the competitiveness and comparative advantage of broiler production in Johor using policy analysis matrix. *International Food Research Journal, 22*(1), 116–121.
14. Hamid, M. A., Rahman, M. A., Ahmed, S., & Hossain, K. M. (2016). Status of poultry industry in Bangladesh and the role of private sector for its development. *Asian Journal of Poultry Science, 11*(1), 1–13.
15. Haque, Q. (1999). Poultry research and development in Bangladesh. *Proceedings of The World Poultry Science Association-Bangladesh Branch*.
16. Hassan, M., Kabir, M., Hasan, M., Sultana, S., Khokon, S., & Kabir, S. M. L. (2016). Prevalence of poultry diseases in Gazipur district of Bangladesh. *Asian Journal of Medical and Biological Research, 2*(1), 107–112.
17. Hussain. (1997). Recent trends in the rural economy of Bangladesh: Poverty and development. Dhaka, Bangladesh: *Institute of Development Studies Journal*.
18. Ibrahim, N., Akhter, M., Mamun, S., Chowdhury, E. H., & Das, P. (2016). Bio-security in small scale poultry farms against avian influenza: Knowledge, attitude, and practices. *Asian Journal of Medical and Biological Research, 1*(3), 670–676.
19. Islam, F., Begum, S., Majumder, A., & Hossain, M. S. (2015). Broiler production at central and southern region of Bangladesh. *Journal of Bioscience and Agriculture Research, 5*(2), 73–79.

20. Islam, M., Hossain, M., Kamal, M., & Hashem, M. (2015). Comparative study on commercial broiler rearing pattern in plain and coastal regions of Bangladesh. *Journal of Environmental Science and Natural Resources*, *6*(1), 89–97.
21. Jabbar, M. A., & Green, D. A. G. (1982). The status and potential of livestock within the context of agricultural development policy in Bangladesh.
22. Jahan, M., Islam, A., Siddique, M., Islam, M., Hasan, M., Shamsuzzaman, A., & W., S. (2014). Effects of integrated use of prilled urea, urea super granule, and poultry manure on yield of transplant Aus rice and field water quality. *Life Science Journal*, *11*(8), 1097–8135.
23. Livestock Economy at a Glance. (2022–2023). Retrieved from https://dls.gov.bd/
24. M.A., B., A, T., Ahia, I. E., & Mohamed Salih, N. (2009). Mortality and diseases status in layer chicken flocks reared in traditional farms in Khartoum-Sudan. *International Journal of Poultry Science*, *8*(3), 264–269.
25. Monira, K., Islam, M., Alam, M., & Wahid, M. (2003). Effect of litter materials on broiler performance and evaluation of manure value of used litter in late autumn. *Asian-Australasian Journal of Animal Sciences*, *16*(4), 555–557.
26. Mozumdar, L., Farid, K., Ahmed, J., & Rahman, M. (1970). Broiler farming: An approach to improve rural livelihood. *Journal of the Bangladesh Agricultural University*, *7*(2), 395–402.
27. Prabakaran, R. (2003). Good practices in planning and management of integrated commercial poultry production in South Asia. *Food & Agriculture Organization*.
28. Rahman, S. M. A., Sayeed, M. A., Sarker, N. R., & Alam, J. (2006). Impact of improved poultry management techniques on socioeconomic condition of broiler beneficiaries. *Journal of the Bangladesh Agricultural University*, *4*(2), 401–411.
29. Rahman, W., Ali, R., & Kabir, M. (2005). Poverty alleviation through livestock and poultry raising in selected areas of Mymensingh District. *Journal of the Bangladesh Agricultural University*, *3*(2), 375–380.
30. Raihan, S., & Mahmud, N. (2008). Trade and poverty linkages. *CUTS International*.
31. Rautenschlein, S., & Alkie, T. N. (2016). Infectious bursal disease virus in poultry: Current status and future prospects. *Veterinary Medicine: Research and Reports*, *9*(1), 9–18.
32. Sultana, F., Khatun, H., & Islam, A. (2013). Small scale broiler farming at Santhia Upazila of Pabna District of Bangladesh. *Bangladesh Journal of Animal Science*, *41*(2), 116–119.
33. Uddin, S. (2009). Bangladesh poultry industry. *Journal of Business and Technology*, *4*(2), 97–112.
34. Hauque, S. (2005). Status of broiler farming in Sherpur sadar upazila (Doctoral dissertation, MS Thesis, Department of Poultry Science, BAU., Mymensingh).
35. Chand V, Chowdhury SD, Saha M, Hossain MK. IFC-SEDF Sector Studies and Baseline Surveys in Poultry in Bangladesh, Final Report. Associates for Development Services Limited, Dhaka, 2009.

Commented [AJ47]: Kindly check this reference and list it appropriately