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Comparative Study on Commercial Broiler Rearing Pattern in Plain and Coastal Regions of Bangladesh

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Abstract: The study was conducted at Sharsa, Jhikargacha, Chawgacha and Jessore sadar upazila of Jessore District regarded as plain and Lalmohon, Borhanuddin, Daulatkhan and Bhola sadar upazila of Bhola District regarded as coastal region with a view to compare the present status and rearing pattern of broiler. Data were collected randomly from selected 52 broiler farmers through personal interview using an interview schedule. The highest number of broiler farmers 69.2% and 57.7% in Jessore and Bhola District, respectively belonged to middle aged group (31-50 years) involved in broiler farming. About 48.1% and 59.6% broiler fermers respondents of Jessore and Bhola District, respectively possessed secondary level of education involved in broiler farming. About 48.08% and 63.46% broiler farmers in Jessore and Bhola District, respectively disinfected their farm using lime water. About 40.38% broiler fermers administered vaccine against ranikhet, gumboro, infectious bronchitis diseases and 36.64% administered vaccine against ranikhet and gumboro diseases in Jessore and Bhola District, respectively. About 36.54% broiler fermers applied antibiotic against coccidiosis, dermatitis and respiratory infection diseases and 44.23% broiler fermers applied antibiotic against coccidiosis, dermatitis and respiratory infection diseases in Jessore and Bhola District, respectively. The highest number of broiler farmers in Jessore District faced great marketing problems due to unfavorable market for selling broiler, high price of feed and chick and in Bhola District the farmers faced great marketing problem due to the unstable and high price of feed and chicks.

Key Words: Broiler farming, Coastal region, Disease management and Plain region.

Introduction

Poultry is an integral part of the farming systems and perform a variety of roles, either supplying products for household, for sale or providing inputs for crop production. Among animal population in Bangladesh about 265.7 million poultry is estimated and the number of poultry per rural household is 2.15 respectively (BBS, 2009**).** Commercial poultry farming system is considered an important venue to reduce unemployment, poverty and malnutrition problem (Ershad *et al.*, 2004). Over the last decade, poultry population has grown spectacularly throughout the world, 23% in developed and 76% in developing countries, respectively. This increase, due to the commercial production, has been most notable in the Far East where growth averaged 90%. However, with increasing population and decreasing land holdings, the number of poultry is increasing at an annual rate of 5.9% (Huque *et al*., 1999). 69% of poultry are reared by small farmers where as 31% are managed by medium and large farmers. The majority portion of farmers raise 77.29% chicken and 84.41% duck, respectively in Bangladesh (Yasmin *et al.*, 1989). About 70,000 different sized poultry farms have been established. Of them 20% has been rearing 1000-50000 birds and the rests are occupied by smallholders who rear 100-1000 birds (Huque Q.M.E 2001). Average annual broiler meat production was recorded as 9454 kilo broiler meat per farm. The per capita consumption of meat per annum is 5.27 kg which is much lower than that of world's average of 9.5 Kg. of meat (Karim, 2001). Broiler production has become a specialized and speedy business at present time for the small-scale farmers of the country. Short life cycle and requirement of relatively less amount of capital attributed to its popularity to the farmers. Broilers are usually marketed at about 35 to 40 days. Within this short duration special care and attention regarding housing, feeding, prevention and control of diseases can make this business profitable. Commercial broiler farming have provided employment opportunities for unemployed family members, improved socio-economic conditions and increased women empowerment among rural people of Bangladesh. In Bangladesh most of the broiler farmers have no formal training related to broiler farming. Consequently, production performances are low. To enrich the farmers and other concerned with updated knowledge training is needed (Ershad *et al.*, 2004). Several researches have been carried out research on broiler production in different location of Bangladesh. But there is an acute shortage of information regarding the present status and rearing pattern of broiler in plain and coastal region of Bangladesh. That's why; the present study was conducted with the following objectives:

1) To investigate the present status of broiler farm between plain and coastal region
2) To know the management practices of broiler in those areas

Materials and methods

The locations of the study area was selected areas of Sharsa, Jhikargacha, Chawgacha and Jessore sadar upazila of Jessore District regarded as plain land and Lalmohon, Borhanuddin, Daulatkhan and Bhola upazila of Bhola District regarded as coastal region. Both districts are situated under the Agro-Ecological Zone (AEZ) of High Ganges River Floodplain and Young Meghna Estuarine Floodplain, respectively (Anonymous, 1988). All the respondents of selected areas having at least 200 or more broilers were selected randomly for the study. Out of broiler farmers, 13 broiler farmers of every upazila were selected that make the total 52 respondents in each district. Data were collected randomly from selected 52 respondents by the researchers themselves through face to face interview by using interview schedule during October 2011 to December 2011. The variables were categorized in some heads e.g. personal information of the respondents (age, educational qualification, training exposure, total annual income from broiler and sources of money), rearing pattern of broiler (strain, sources of chick, housing management, summer management, winter management, litter management, feeding management etc.) and disease management (sources of veterinary service, vaccination and antibiotic application, disinfection and disposal of dead bird). After completion of interview all the interview schedules were compiled for its data processing. At the beginning of the data processing all the qualitative data were converted into quantitative form. Local units were converted into standard units. The data were coded and tabulated in a data sheet. Then data were entered in statistical software for further analysis. The SPSS 12.0 computer package program was used to analyze the data. All personal traits were categorized and then frequency and percentage of the respondents were calculated.

Results and Discussion

Personal and socio-economic characteristics of the broiler farmers:

It was found from the Table 1 that 69.2% in Jessore and 57.7% broiler fermers in Bhola district belongs to middle aged group, followed by young aged group 24.1% and 25.0% and only 7.7% and 17.3% in Jessore and Bhola district, respectively belongs to old aged group involved in broiler farming. It is evident that in Jessore district the middle aged people were more involved in broiler farming as compared to that of Bhola district. The maximum number of broiler farmers both in Jessore and Bhola district, respectively had secondary level of education, followed by higher secondary level 17.3% and 25% in Jessore and Bhola district, respectively. Only 11.5% farmers were illiterate in Jessore district. The majority of the broiler fermers (44.2% and 57.7%) under Jessore and Bhola district, respectively had no training on broiler farming and only lowest number of respondents (3.8%) in Jessore district had higher training. The highest percentage of the broiler farmers (76.9% & 86.54%) under Jessore and Bhola district, respectively possessed less number of broilers in their farm while the lowest number of broiler farmers (3.8% and 1.92%) in Jessore and Bhola district, respectively had large number of broiler in their farm. It was also found that 46.2% and 13.5% broiler farmers under Jessore and Bhola district, respectively earned medium income from broiler. About 17.3% and 71.2% broiler farmers in Jessore and Bhola district, respectively earned high income from broiler. Only 36.5% and 15.4% broiler farmer in Jessore and Bhola district, respectively earned low income from broiler. It is clear that more than two-third of the respondents incurred with broiler farming in Jessore district earned medium income from broiler and in Bhola district more than half of the broiler producer earned high income from broiler.

Table : Personal and socio-economic characteristics of the respondents (n=52)

Age group (year)		**Number**		**Distribution of the respondents (%)**		**Max**		**Min**		**Mean±SD**	
		Jessore	**Bhola**	**Jessore**	**Bhola**	**Jessore**	**Bhola**	**Jessore**	**Bhola**	**Jessore**	**Bhola**
Young	up to 30	12	13	24.1	25.0	65	65	25	22	40.90 ±10.86	43.02 ±9.73
Middle	31-50	36	30	69.2	57.7						
Old	>50	4	9	7.7	17.3						
Level of education (year)											
Illiterate	0	6	0	11.5	0	18	17	0	5	8.46 ±4.44	10.81 ±2.70
Primary	1-5	8	1	15.4	1.9						
Secondary	6-10	25	31	48.1	59.6						
Higher secondary	11-12	9	13	17.3	25						
Graduate / Post graduation	>12	4	7	7.7	13.5						
Exposure to training (number)											
No Training	0	23	30	44.2	57.7	3	2	0	0	0.71 ±0.77	0.48 ±0.64
Low Training	1	23	18	44.2	34.6						
Medium Training	2	4	4	7.7	7.7						
High Training	>2	2	0	3.8	0						
Farm size (number of broiler)											
Small	Up to 500	40	45	76.9	86.54	10000	4500	200	300	817.31 ±1678.46	1135.58±861 .62
Medium	501-1000	10	6	19.2	11.54						
Large	>1000	2	1	3.8	1.92						
Income from broiler farming (BDT; BDT 83.75 = 1$)											
Low income	Up to 300000	19	8	36.5	15.4	3600000.00	3037500.00	80000.00	75600.00	477135.58 ±584223.11	814208.65 ±556001.14
Medium income	300001-500000	24	7	46.2	13.5						
High income	>500000	9	37	17.3	71.2						

Present status of the broiler farmers:

Table 2 shows that own money and bank loan were the main source of money for 40.38% and 23.08% broiler farmers in Jessore and Bhola districts, respectively. Own and NGO's loan were also another important source of money for 32.69% and 15.38% broiler farmers in Jessore and Bhola districts, respectively. Only 5.77% and 13.31% broiler farmers

in Jessore and Bhola districts, respectively used NGO's loan to start broiler farming.

Table 2 also showed that more than half of the broiler farmers in Jessore and Bhola districts, respectively started their farm with Cov-500 broiler strain. The majority of broiler farmers (55.77% and 67.31%) in Jessore and Bhola districts, respectively bought chicks from Aftab Bohumukhi Farms Ltd. About 17.31% and 7.69% broiler farmers in Jessore and Bhola districts, respectively collected day old chick from Kazi Poultry Farms Ltd. Only 11.54% farmers collected chicks from Pragon Poultry Farms Ltd. in Bhola districts. It is clear that most of the respondents bought chicks from Aftab Bohumukhi Farms Ltd. due to their better quality of chicks.

Table 2: Categories of the respondents on the basis of sources of money and broiler stain (n=52)

Source of money	**Citation number**			
	Number		**Distribution of the respondents (%)**	
	Jessore	**Bhola**	**Jessore**	**Bhola**
Own	5	3	9.62	5.77
Bank loan	2	0	3.85	0
NGO loan	3	9	5.77	13.31
Job	0	3	0	5.77
Own + bank loan	21	12	40.38	23.08
Own + NGO loan	17	8	32.69	15.38
Own + Job	0	2	0	3.85
Bank loan + NGO loan	1	2	1.92	3.85
NGO loan + Others	2	2	3.85	3.85
Bank loan + Job	0	2	0	3.85
Own + Bank loan +Job	0	3	0	5.77
Own +NGO loan +Job	0	2	0	3.85
Own + Others	1	1	1.92	1.92
Own + NGO loan + Others	0	3	0	5.77
Name of the strain reared				
Cov-500	27	30	51.52	57.69
Lohman meat	1	0	1.92	0
Habbard classic	19	13	36.54	25
Others	5	9	9.62	17.31
Name of the hatcheries supplied				
Aftab Bohumukhi Farms Ltd.	29	35	55.77	67.31
Kazi Poultry Farm Ltd.	9	4	17.31	7.69
Afil Agro Ltd.	7	0	13.46	0
Nourish Poultry Farm	3	4	5.77	7.69
Pragon Poultry Farm Ltd.	0	6	0	11.54
Others	4	3	7.69	5.77

NB : NGO, Non-government organization.

Special managemental precaution of the broiler farmers:

Table 3 shows that the majority of the respondents (44.23% and 55.77%) reduced ambient temperature using electric fan, supply of saline water and maintaining proper ventilation while 25% and 13.46% broiler farmers in Jessore and Bhola districts, respectively used electric fan and proper ventilation. Only 17.31% and 13.46% farmers in Jessore and Bhola districts, respectively used electric fan and saline water to reduce ambient temperature during summer in broiler farm. Majority of the broiler farmers (75% and 76.92%) in Jessore and Bhola districts, respectively increased ambient temperature during winter season using curtain and light. The highest number of broiler farmers (28.85%) kept their farm 15 days interval before starting another batch and 30.77% broiler farmers kept their farm 5 days interval in Jessore and in Bhola districts, respectively. Only 1.92% of broiler farmers kept interval their farm from rearing for 30 days before starting another batch in Jessore.

Table 3: Distribution of the respondents on the basis of special managerial precaution (n=52).

Management during summer season	Citation Number			
	Number		Distribution of the respondents (%)	
	Jessore	Bhola	Jessore	Bhola
Means for reducing ambient temperature				
Electric fan	3	5	5.77	9.62
Proper ventilation	1	2	1.92	3.85
Electric fan + ventilation	13	7	25.0	13.46
Electric fan + Drinking of saline water	9	7	17.31	13.46
Electric fan + Drinking of saline water + ventilation	23	29	44.23	55.77
Others	3	2	5.77	3.85
Management during winter season				
Means for improving ambient temperature				
Curtain	1	2	1.92	3.85
Light	11	9	21.15	17.31
Curtain + light	39	40	75.0	76.92
Others	1	1	1.92	1.92
Interval between two batches (days)				
5	10	16	19.23	30.77
7	7	2	13.46	3.85
9	3	10	5.77	19.23
12	9	7	17.31	13.46
15	15	11	28.85	21.15
18	2	1	3.85	1.92
20	3	1	5.77	1.92
25	2	4	3.85	7.69
30	1	0	1.92	0

Feeding management and performance of the broiler:

Table 4 shows that majority of the broiler farmers both in Jessore and Bhola districts, fed their chicks Vit-C after receiving. About 13.46% and 25% broiler farmers in Jessore and Bhola districts, respectively fed their chicks glucose. 21.15% and 1.92% farmers fed their broiler cost @BDT 27 / kg of feed while only 1.92% farmers fed their broilers cost @ BDT 30/kg of feed in Jessore and Bhola districts, respectively. About 40.38% and 36.54% of broiler farmers in Jessore and Bhola districts, respectively reared broiler for 35 days while only 1.92% in Bhola district, respectively reared their broiler for 43 days. Most of the respondents under Bhola district reared broiler for short duration as compare to that of Jessore district. Table 4 also shows that broiler attained 280 g/week body weight in the farm of 40.38% and 21.15% farmers in Jessore and Bhola districts, respectively. Only 13.46% and 30.77% broiler farmers in Jessore and Bhola districts, respectively told that broiler gained body weight 270 g/week.

Table 4: Distribution of the respondents on the basis of feeding management and broiler performance (n=52)

Feeding management of chick after arrival	Citation Number			
	Number		Distribution of the respondents (%)	
	Jessore	Bhola	Jessore	Bhola
Vitamin-C	31	27	59.62	51.92
Glucose	7	13	13.46	25.0
Glucovate	1	2	1.92	3.85
Saline	11	9	21.15	17.31
Others	2	1	3.85	1.92
Grower and finisher feed price (average price in BDT, BDT 83.75 = 1$))				
24.5	7	7	13.46	13.46
25	4	5	7.69	9.62
25.5	7	7	13.46	13.46
26	3	7	5.77	13.46
26.5	14	5	26.92	9.62
27	11	12	21.15	23.08
27.5	1	3	1.92	5.77
28	2	2	3.85	3.85
28.5	2	1	3.85	1.92
30	1	1	1.92	1.92
31	0	2	0	3.85
Duration of rearing (days)				
35	21	19	40.38	36.54
36	5	9	9.62	17.31
37	7	5	13.46	9.62
38	1	3	1.92	5.77
39	5	5	9.62	9.62
40	1	1	1.92	1.92
41	2	1	3.85	1.92
42	7	9	13.46	17.31
43	0	1	0	1.92
44	1	1	1.92	1.92
45	2	0	3.85	0
Body weight gain /week (g)				
250	3	1	5.77	1.92
260	5	9	9.62	17.31
270	7	16	13.46	30.77
280	21	11	40.38	21.15
290	1	5	1.92	9.62
300	7	5	13.46	9.62
310	8	5	15.38	9.62

Disease Management of Broiler:

Table 5 shows that most of the broiler farmers (36.54%) used own veterinary knowledge for disease combat in Jessore and 28.85% farmers in Bhola district got veterinary service from NGOs. About 25% and 13.46% broiler farmers in Jessore and Bhola district, respectively got veterinary service from private practitioner. Most of the broiler farmers (48.08% and 63.46%) disinfected their farm by using lime water while 17.31% and 1.92% broiler farmers in Jessore and Bhola district, respectively disinfected farm using Lysol disinfectant. About 40.38% farmers administered vaccine against Ranikhet, Gumboro and Infectious Bronchitis diseases and 36.64% farmers administered vaccine against Ranikhet and Gumboro diseases in Jessore and Bhola district, respectively. Only 25% farmers administered vaccine against Ranikhet, Gumboro, Marek's and Infectious Bronchitis diseases in Jessore and 28.85% farmers administered vaccine against Ranikhet, Gumboro and Infectious Bronchitis diseases in Bhola districts. Majority of the farmers in Jessore and Bhola districts, respectively administered antibiotic against Coccidiosis, Dermatitis and Respiratory infection diseases. About 28.85% and 25.0% of the farmers in Jessore and Bhola district, respectively administered antibiotic against Coccidiosis, Dermatitis, Respiratory infection and Wingrot diseases. It is clear that most of the farmers in Jessore district applied antibiotic against Coccidiosis, Dermatitis and Respiratory

infection diseases while in Bhola, most of the farmers applied antibiotic against Coccidiosis, Dermatitis, Respiratory infection and Wingrot diseases. The occurrence of diseases varies due to geographical variation.

Table 5: Categories of the respondents on the basis of diseases management (n=52)

Source of Veterinary Service	**Citation Number**			
	Number		**Distribution of the respondents (%)**	
	Jessore	**Bhola**	**Jessore**	**Bhola**
Own veterinary knowledge	19	6	36.54	5.77
Government veterinary doctor	0	6	0	11.54
Private practitioner	13	7	25.0	13.46
Veterinary doctor from NGOs	4	15	7.69	28.85
Veterinary doctor from NGOs + Private practitioner	3	2	5.77	3.85
Veterinary doctor from NGOs + Government veterinary doctor + Own veterinary knowledge	1	3	1.92	5.77
Veterinary doctor from NGOs + Government veterinary doctor	1	7	1.92	13.46
Own veterinary knowledge + Veterinary doctor from NGOs	4	2	7.69	3.85
Own veterinary knowledge +Private Practitioner	2	2	3.85	3.85
Own veterinary knowledge + Veterinary doctor from NGOs + Private Practitioner	5	1	9.62	1.92
Disinfection of farm after rearing one batch (disinfectant used)				
QAC	3	0	5.77	0
Lysol	9	1	17.31	1.92
Lime water	25	33	48.08	63.46
Vircon	7	2	13.46	3.85
Lime water + Bleaching powder	2	12	3.85	23.08
Others	6	4	11.54	7.69
Vaccination used for the diseases				
Ranikhet diseases	5	3	9.62	5.77
Gumboro + Marek's diseases	1	4	1.92	7.69
Ranikhet + Gumboro diseases	5	19	9.62	36.64
Ranikhet + Gumbor+ Marek's diseases	6	3	11.54	5.77
Ranikhet + Gumboro + Infectious Bronchitis	21	15	40.38	28.85
Ranikhet + Gumboro+ Marek's + Infectious Bronchitis diseases	13	8	25.0	15.38
Others	1	0	1.92	0
Antibiotics used for the diseases				
Name of the Disease				
Coccidiosis + Dermatitis	3	1	5.77	1.92
Coccidiosis + Dermatitis+ CRD	5	6	9.62	13.46
Coccidiosis + Dermatitis+Pullorum	3	3	5.77	9.62
Coccidiosis + Dermatitis + Respiratory infection	19	23	36.54	44.23
Coccidiosis +Dermatitis + Respiratory infection+ Fowl coryza	1	3	1.92	5.77
Coccidiosis + Dermatitis + Respiratory infection + Wingrot	15	13	28.85	25.0
Dermatitis + CRD + Respiratory infection	2	1	3.85	1.92
Dermatitis +Pullorum +CRD+ Respiratory infection	3	1	5.77	1.92
Others	1	1	1.92	1.92

Litter management of the broiler farmers:

Table 6 shows that majority of the broiler farmers (55.77% and 63.46%) used rice husk as litter material on floor while only 3.85% and 0% respondents in Jessore and Bhola districts, respectively used chopped straw. It was found that most of the broiler farmers treated litter materials in sun light while only 5.77% and 1.92% farmers in Jessore and Bhola districts, respectively treated litter using heat. Majority of the

broiler farmers (92.31% and 98.08%) used litter 1-4 inch height on the floor while 7.69% and 1.92% farmers in Jessore and Bhola districts, respectively used litter 5-9 inch height. About 75% and 94.23% broiler farmers in Jessore and Bhola districts, respectively suggested that litter got wetted with droppings and water. Only 7.69% and 1.92% broiler farmers in Jessore and Bhola districts, respectively suggested that litter got wetted from others sources. Most of the broiler farmers (40.39% and 30.77%) in Jessore and Bhola districts, respectively treated their wet litter with Ca $(OH)_2$ for removing of moisture. About 21.15% broiler farmers in Jessore treated litter with powder like materials. It is clear that the highest number of broiler farmers in Jessore and Bhola districts treated their wet litter materials with $Ca(OH)_2$. About 5.77% and 32.69% broiler farmers disposed the spent litter materials as manure. While 34.62% and 36.54% in Jessore and Bhola districts, respectively disposed as fish feed.

Table 6: Categories of broiler farmers on the basis of litter materials (n=52)

Name of the litter materials used	**Citation Number**			
	Number		**Distribution of the respondents (%)**	
	Jessore	**Bhola**	**Jessore**	**Bhola**
Saw dust	21	15	40.38	28.85
Rice husk	29	33	55.77	63.46
Chapped straw	2	0	3.85	0
Others (Rice polish)	0	4	0	7.69
Treatment of litter before using				
Sun drying	39	43	65.38	82.69
Heat treatment	3	1	5.77	1.92
Chemical treatment	9	7	17.31	13.46
Others	1	1	1.92	1.92
Height of the litter on the floor (inch)				
1-4	48	51	92.31	98.08
5-8	4	1	7.69	1.92
9-15	0	0	0	0
Source of litter get wetted				
Droppings	9	2	17.31	3.85
Droppings + Water	39	49	75.0	94.23
Others	4	1	7.69	1.92
Method of treatment of wetted litter				
$Ca(OH)_2$	21	31	40.39	30.77
Powder materials	11	0	21.15	0
Change	15	16	28.85	59.62
Others	5	5	9.62	9.62
Uses of spent litter				
Manure	4	17	5.77	32.69
Fuel	1	1	1.92	1.92
Fish feed	17	19	34.62	36.54
Manure+ Fish feed	27	14	51.92	26.92
Others	3	1	5.77	1.92

Problem faced for marketing:

Table 7 shows that about half of the broiler farmers faced great marketing problems due to unfavorable market for selling broiler and high price of feed and chick in Jessore district and 38.46% faced great marketing problems due to the price of feed and chick are not fixed; high price of feed and chick in Bhola districts.

Table 7: Categories of the respondents on the basis of marketing problems (n=52)

Problems faced for marketing	Citation number			
	Number		Distribution of the respondents (%)	
	Jessore	Bhola	Jessore	Bhola
Price of feed and chick are not fixed	1	4	1.92	7.69
High price of feed and chick	6	2	11.54	3.85
Unfavorable market for selling broiler	5	0	9.62	0
Price of feed and chick are not fixed + High price of feed and chick	3	20	5.77	38.46
Unfavorable market for selling broiler + High price of feed and chick	25	5	48.08	9.62
High price of feed and chick + Unfavorable market for selling broiler	4	4	7.69	7.69
The price of feed and chick are not fixed + High price of feed and chick + Unfavorable market for selling broiler	2	10	3.85	19.23
Others	6	7	11.54	13.46

Conclusion

In both districts the middle aged group and farmers of secondary level education were highly involved with broiler farming. Most of the broiler farmers in Bhola district were belonged to high income group as compared to Jessore district. About 51.52% farmers brought "Cov-500 strains" and 36.54% brought "Habbard classic" in Jessore and Bhola district respectively. More than half of the broiler farmers in Jessore and Bhola district, respectively treated litter materials in sun light. The most appropriate treating way of wet litter materials were using Ca $(OH)_2$ in Jessore and Bhola district. About 48.08% and 63.46% in Jessore and Bhola district, respectively disinfected their farm by using lime water. About 36.54% and 44.23% in Jessore and Bhola district respectively applied antibiotic against Coccidiosis, Dermatitis and Respiratory infection diseases. Further in depth study is needed to explore more information related to comparison of broiler production aspects in plain and coastal belt of Bangladesh.

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