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Research Article

Economic Profitability of Broiler Farm Comparing the Two Commercial Broiler Strain

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Abstract

This study was conducted to investigate the economic profitability of two commercial broiler strains in Hathazari Upazilla, Chittagong. For the study purpose, we selected ten broiler farms in different place in study area. We took five Cobb-500 and five Lohmann strain rearing farm. An informative questionnaire developed for collecting data from study area. These studies mainly focused on determine economic traits of broiler strain. Mainly body weight, Feed Conversion Ratio (FCR) and Mortality rate were estimate for comparing the two strains. These parameters were considered from DOC (Day-old-chick) to thirty-two days. Cobb-500 strain shows the high body weight (avg. 2.4kg) than the Lohmann strain (avg. 2.16kg). Along with this, FCR also varies in these two strains. Cobb-500 also shows highest FCR (1.53) whereas Lohmann has less FCR (1.43). These variations may occur due to several factors such as strains, sex, feed, disease incidence, environmental condition, and so on. We also consider the mortality rate for comparing these two strains. Highest mortality rates (7%) are observed in the Lohmann strain. It may be concluded that, Cobb-500 may perform the best performance in body weight, FCR and Mortality rate than in Lohmann strain. As a result, Cobb-500 may also be recommended for commercial boiler production in Hathazari Upazilla.

Keywords: Broiler; Strains; Body weight; Production

Introduction

Broiler is an important part of commercial poultry sector. The modern meat chicken is a fast growing, highly efficient and can rapidly fulfill the shortage of protein requirement of the country, as it can be produced within a very short time compared to other meat producing animals. Broiler production provides employment and regular income within the shortest time possible due to its fastest body growth and shorter production cycle and low initial investment. Broiler chickens can play an important role to reduce the shortage of huge protein requirement in the country. Broiler meat is considered as a major source of high quality animal protein that required for body growth and mental development of an individual.

At present, broiler farming is being popular both in urban and rural areas. It has encouraged the people of different sections such as small farmers, landless laborers and educated unemployed as well as for industrialists to establish broiler farms on small & large scale. The growth performance of broiler bird might simply be a function of increased feed intake. Feed consumption followed similar trend to that of weight gain. According to [1], low cost of production and higher returns are the key factors for higher profit in broiler farming. Many people are now being encouraged in this enterprise as maximum return can be achieved shortly by investing minimum capital in broiler production.

Now-a-days, broiler industry has brought about revolutionary changes and extended tremendously during the last couple of decades across the globe. The body weight gain of the broiler strains has been markedly increased and the feed utilization has been strongly improved with the advancement of new technology applied in poultry nutrition as well as in genetics development. This progress in breeding and nutrition has resulted in broiler strains having higher performances today than ever before [2].

Figure 1: Brooding system of Day-old-chick.

The major concept of the broiler industry is to increase the productivity of the broiler carcass to gain higher profit with low investment. The genetic contribution of the broiler chicken as well as non-genetic factors such as age of slaughter, sex, nutrition and management practices are equally responsible to boost the bird's performances [3,4,5]. Considering this view, the present study was undertaken to find out the suitable strain and the performances of broiler chickens which give the higher meat yield and better profit under commercial farming condition.

Materials and Methods

The present study was undertaken to investigate the rearing

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Table 1: Data collection from ten commercial broiler farms.

Parameters	Farms (F1....F10)									
	Cobb 500					Lohmann				
	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
Farm Size (sq.ft)	1200	1500	1200	4000	1600	600	2500	1300	1200	3000
Farm capacity (bird no.)	1000	1200	1000	3500	1500	600	2200	1200	1000	3000
No. of birds reared	900	1200	1000	3500	1400	500	2000	1000	1000	3000
Feed price (Tk/kg)	43	43	43.5	42.5	43	43	43	43	42	43
Mortality rate	3%	2%	10%	2%	3%	2%	5%	3%	15%	10%
Rearing length (days)	32	32	32	32	32	32	32	32	32	32
Amount of feed intake upto selling period (kg)	2955	3750	3103	8785	3391	1263	5909	2812	2948	7734
Body weight (Kg/b)	2.4	2.5	2.3	2.4	2.4	2.5	2.2	2	2.2	1.9
Floor per bird (sq.ft/b)	1.2	1.25	1.2	1.2	1.1	1.1	1.2	1	1.2	1
Selling cost (Tk/kg)	105	115	121	110	115	122	133	128	137	130

Figure 2: Rearing system of broiler at 24 days.

Table 2: Feed intake (FI) of broiler chickens at 30 days.

Strains	Farms-----	F1	F2	F3	F4	F5	Average
Cobb 500	FI (kg/b)	3.6	3.1	3	2.9	2.9	**3.1**
Lohmann	Farm -----	Farm 6	Farm 7	Farm 8	Farm 9	Farm 10	-
	FI (kg/b)	3.2	3.3	3	2.9	2.8	**3.04**

Table 3: Body weight (BW) of commercial broiler chickens of two different strains at 30 days.

Strains	Farms-----	F1	F2	F3	F4	F5	Average
Cobb 500	BW (Kg/b)	2.4	2.5	2.3	2.4	2.4	**2.4**
	Farm--	Farm 6	Farm 7	Farm 8	Farm 9	Farm 10	
Lohmann	BW (Kg/b)	2.5	2.2	2	2.2	1.9	**2.16**

management practices and economic profitability broiler strain commercial broiler farm at Hathazari Upazilla, Chittagong, Bangladesh.

Study area

The study was conducted at the different commercial broiler farms of Hathazari Upazilla, Chittagong. The necessary data of the farms were taken from March 2017 to June 2017. During this period data was collected from the ten selected commercial broiler farms available in that area.

Farm selection

Ten commercial broiler farms of the study areas were selected randomly for this study. The farm was consisting of five Cobb 500 strains and five Lohmann broiler strains.

Data collection

A questionnaire was developed to collect data from the selected farms. The collected data were shown in Table 1.

House preparation

The broiler house was prepared by washing and cleaning before entering the birds into the farms. For this purpose, different commercial disinfectant agents are used in the maximum farms. This chemical agent was mainly applied for washing the farm floor, drinker, feeder, hover, chick guard, foot wash, hand wash in different concentrate.

Source of day-old chick (DOC) collection

The farmers collected DOC from the different local breeder hatchery to execute their poultry farming business. The price of DOC very often varies ranging from 16Tk (minimum) to 75Tk (maximum), as reported by the farm owners.

Housing, feeding, watering and brooding management of the chicks

The chicks were reared in the floor system at the open sided housing condition from day-old to marketing age. The chicks were brooded 3 to 7 days with chick guard and hoover equipped with electric bulb. The floor space per bird was given 1 to 1.25 square feet. Birds were fed readymade broiler diet ad libitum collected from the different local feed companies. Fresh, clean drinking water was provided the birds all the rearing time. Pellet feed was preferred most of the time to feed their broiler. The price of the feed varies from 42Tk to 44Tk per kg. Brooding system of DOC and rearing system of broiler at twenty-four days are show in the Figure 1 and 2.

Vaccination and medication

All the chicks were vaccinated against particular diseases and some medication was also provided the birds for their proper growth and development during the rearing period by the farmers.

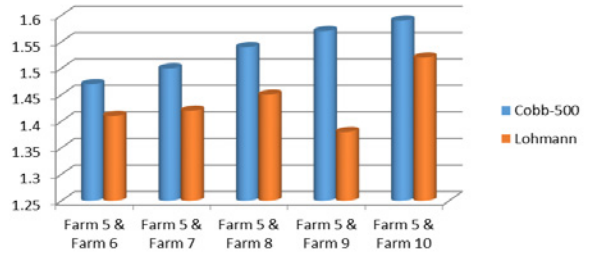

Figure 3: Comparative FCR of two commercial strain farms.

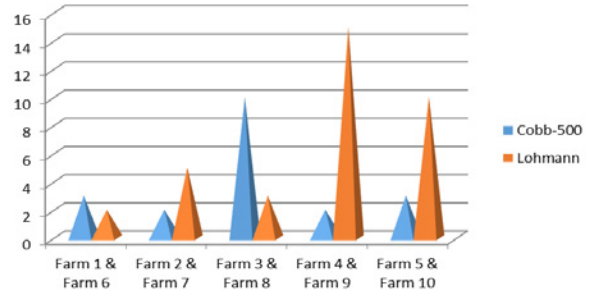

Figure 4: Comparative mortality rate of ten commercial broiler farms.

Disease incidence and medication

Farmers were faced diseases problems with the birds while rearing those at their farming condition. These were assumed to be bacterial, viral, fungal or parasitic infections. The birds were seemed to be affected by the various diseases namely Colibacillosis, Salmonellosis, Infectious coryza, Newcastle disease, Infectious bursal disease, Brooder pneumonia, Coccidiosis etc. as per the sign and syndromes shown by the birds recorded in the farms. Farmer himself or registered veterinarian gives the treatment of these cases. Treatment is given by the mainly on the clinical signs and symptoms or by post mortem findings.

Statistical analyses

The collected data were analyzed after coding, decoding, summarized while locating at the CVASU campus with the correspondence of supervisor. Simple statistical methods such as mean and percentage etc. were used to analyze the collected data.

Calculation of production data

Feed intake of broiler chicken: Feed intake is measured from day one up to day thirty. It is calculated for one farm by total feed intake in farm is divided by total number of live birds. And finally estimate as mean value for finding the average value.

Body weight of broiler chicken: Body weight is collected from the broiler farm during selling time. Here only mean value of bird's weight is estimated for each farm.

Feed Conversion Ratio (FCR): FCR is measured for one farm by the total feed intake (kg) is divided by the total body weight (kg).

Mortality: Mortality rate is calculated by percentage for record of each farm.

Cost-benefit analyses: Data on cost benefit analyses of broiler chickens were assessed from the various costs represent by the individual farm.

Results and Discussion

Growth performances and mortality of broiler chickens of two broiler strains

Feed intake of broiler chickens: The average feed intake of two broiler strains rearing in the different commercial farms are shown in the Table 2. The result shows that Cobb 500 consumed a little bit more feed than the Lohman strains on day thirty. Cobb 500 feed consumption ranges from 2.9 to 3.6 kg/bird while Lohmann strains 2.9 to 3.3 kg/bird respectively are observed in our current study (Table 2). The average Feed Intake of Cobb 500 and Lohmann was 3.1 and 3.04 respectively.

Body weight of broiler chickens: The average body weight of two broiler strains rearing in the different commercial farms are shown in the Table 3. The result shows that Cobb 500 gained a little bit more body weight than the Lohman strains on day thirty. Cobb 500body weight ranges from 2.3 to 2.5 kg/b while Lohmann strains 1.9 to 2.5 kg/b respectively are observed in our current study (Table 3). The average body weight of Cobb 500 and Lohmann was 2.4kg and 2.16kg respectively.

Feed Conversion Ratio (FCR): The feed conversion ratio (FCR) of two strains was measured on day thirty. The FCR values of Cobb 500 broiler strain were 1.47, 1.50, 1.54, 1.57, 1.59 and Lohmann strains farms being 1.41, 1.42, 1.45, 1.38 and 1.52 respectively (Figure 3). The average FCR value of Cob500 broiler strain was 1.53 whereas the FCR of Lohmann strain being 1.44 on days thirty. The value indicates that Cobb 500 strain is more efficient in converting feed to meat than that of Lohmann strain.

Mortality: The mortality (%) recorded for Cobb 500 broiler strains are 3%, 2%, 10%, 2%, 3% and the Lohmann strain are 2%, 5%, 3%, 15% and 10% respectively. The average mortality (%) recorded for Cobb 500was 4.0%, while the mortality (%) for Lohmann was 7 %. The result of mortality implies that Lohmann broiler strain had higher mortality than the Cobb 500 strain in this study. The comparative mortality rate of ten commercial broiler farms of two broiler strains are shown graphically through Figure 4.

Cost benefit analyses of two commercial broiler strains

The data of cost benefit analyses of two broiler strains are shown in Table 4 and 5. The data showed that profit of per kg live bird was higher for Cobb 500 broiler farms than that of Lohmann farms. The production cost was also lower in the Cobb 500 farms than that of Lohmann broiler farms. The higher production cost and low body weight gain might be a reason for low profitability of Lohmann broiler.

The aim of this study was to focus on the productivity and assessing of economic profitability of comparing two commercial broiler strains and also their management system in Hathazari Upazilla, Chittagong. Traditionally, the salient criteria for estimating the performance of the broiler strains have been growth rate and feed conversion efficiency, and less frequently, carcass yield and composition [6,7,8]. Some strains might show higher mortalities and a great variation in final body weight than others due to several factors (strains, sex, feed, disease incidences, environmental condition and

Table 4: Detail Cost Benefit analysis of Cobb500 strains farms.

Parameters/Items	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
Live weight (kg/b) on the last day of trial 30days	2.4	2.5	2.3	2.4	2.4
No. of birds' survivability/treat.	873	1176	900	3430	1358
Feed intake (kg/b) on 30 d	3.6	3.1	3	2.9	2.9
Feed cost (Tk/kg) on an average	43	43	43.5	42.5	43
Total Feed intake (kg)	2955	3750	3103	8785	3391
Total Feed cost (Tk)	127065(43×2955)	161250	134980	373362	145813
Total live weight (kg) of birds per treatment	2095.2(2.4×873)	2940	2070	8232	3259.2
A). Feed cost (Tk/kg live weight)	60.65(127065/2095.2)	54.85	65.21	45.35	44.74
Day-old chick cost (TK/bird)	16	38	70	29	25
B). Day-old chick cost (Tk/kg live bird)	6.67(16/2.4)	15.2	30.4	12	10.4
Other costs include:					
i) Vaccination cost	2500	4000	2500	10000	4000
ii) Medication cost	1000	2000	1000	3000	2000
iii) Disinfectant cost	500	500	500	1000	1000
iv) Bulb & wire cost	500	500	500	1000	1000
v) Water & Electricity cost	1000	1000	1000	1500	700
v) Labour cost	5000	5000	5000	1000	5000
vi) Transport cost	1000	1500	1000	3000	1200
Total other cost (Tk) [i….vi]	11500	14500	11500	20500	14900
Other cost (Tk/kg live wt)	5.49(11500/2095.2)	4.9	5.6	2.5	4.57
C). Other cost (Tk/kg live weight)	5.49	4.9	5.6	2.5	4.57
D). Total production cost (Tk/kg live wt.) [A+B+C]	72.81	74.95	101.21	59.85	59.71
E). Selling live bird market price (Tk/kg live bird)	105	115	121	110	115
Profit (Tk/kg live bird) [E-D]	**32.19**	**40.05**	**19.79**	**50.15**	**55.29**

Table 5: Detail Cost benefit analysis of Lohmann strains of five farms.

Parameters/Items	Farm 6	Farm 7	Farm 8	Farm 9	Farm 10
Live weight (kg/b) on the last day of trial 30days	2.5	2.2	2	2.2	1.9
No. of birds' survivability / treat.	588	1900	970	850	2700
Feed intake (kg/b) on 30 d	3.2	3.3	3	2.9	2.8
Feed cost (Tk/kg) on an average	43	43	43	42	43
Total Feed intake (kg)	1263	5909	2812	2948	7734
Total Feed cost (Tk)	54309(43×1263)	254087	120916	123816	332562
Total live weight (kg) of birds per treatment	1470(2.5×588)	4180	1940	1870	5130
A). Feed cost (Tk/kg live weight)	36.9(54309/1470)	60.79	62.3	66.2	64.8
Day-old chick cost (TK/bird)	21	70	72	55	42
B). Day-old chick cost (Tk/kg live bird)	8.4(21/2.5)	31.8	36	25	22.1
Other costs include:					
i) Vaccination cost	2000	10000	4500	4000	11000
ii) Medication cost	1000	4000	2500	5500	6000
iii) Disinfectant cost (iosan & phenyl)	500	1000	600	700	1200
iv) Bulb & wire cost	500	1000	800	1000	1500
v) Water & Electricity cost	500	1000	1000	1000	1000
v) Labour cost	5000	6000	5000	600	12000
vi) Transport cost	1000	3000	1200	1500	3000

Total other cost (Tk) [i…..vi]	10500	26000	15600	14300	35700
Other cost (Tk/kg live wt)	7.14(10500/1470)	6.22	8.04	7.65	6.96
C). Other cost (Tk/kg live weight)	7.14	6.22	8.04	7.65	6.96
D). Total production cost (Tk/kg live wt.) [A+B+C]	52.44	98.81	106.34	98.85	93.86
E). Selling live bird market price (Tk/kg live bird)	122	133	128	137	130
Profit (Tk/kg live bird) [E-D]	**69.56**	**34.19**	**21.66**	**38.15**	**36.14**

so on). However, a bit differences were observed in the live weight and average body weight gain between the two broiler strains rearing under the farming conditions of the Hathazari, Chittagong in this recent study. Cobb 500 broiler strain achieved heavier body weight and higher weight gain than the Lohmann strain. The improved body weight gains of this strain, possibly due to higher feed intake including several other factors. Our results are in agreement with the reports of several other previous researchers [9,10], who found similar variations in rearing different strains under experimental conditions. The differences of the live weight and weight gain of the broiler strains might be explained by different factors, for example, genotype, feed, sex, strains, environmental conditions, climatic effects and so on. Gonzales E et.al. found strain effects among several strains of birds in live weight [9]. Korver DR et.al. reported that genotype might affect the body weight of different broiler strains [11]. Genetic variation of the strains amongst other factors might give rise to body weight variation between two individual birds. So it is assumed that more weight gain of Cobb 500 broiler strain might arise from the genetic make-up during the embryonic stage, which can lead to having different growth potential, and it may be possible owing to the strain effect, and some other factors might be involved herewith.

The Cobb 500 broiler strain had higher profit than the Lohman strain as observed in this study. The increased profitability of Cobb 500 broiler strains might be a result of higher body weight gain and lower production cost. The cost-benefit assessment of a poultry enterprise is often determined by the level of risk to which the reared flocks are exposed to bio-security measures [12,13,14]. Apart from these, the profit margin in poultry production depends mainly on feed utilization, cost of day-old chicks and efficient management of such resources as land, day laborers and appliances [15]. Studies on the financial dynamics of smallholder farms, poultry production and profits can be increased by the use of appropriate feed, capital, vaccines and adoption innovative approaches [16,17,18].

Conclusion

From the study it may be concluded that Cobb 500 broiler strain had better body weight, low mortality and higher profit than the Lohmann strain. It implies that Cobb 500 has good potentials to be reared profitably under farming condition.

References

1. Zahir-ud-Din MF, Durrani FR, Chand N, Ahmed J. Status of broilers produced in Swat, Pakistan. Livestock Research for Rural Development. 2001; 13: 67-67.
2. Bogdangnov GA. Feeding of Farm Animals, Russia. 1990: 105-494.
3. Hossain MA, Suvo KB, Islam MM. Performance and Economic Suitability of Three Fast Growing Broiler Strains Raised Under Farming Condition in Bangladesh. International Journal of Agricultural Research, Innovation and Technology. 2013; 1: 37-43.
4. Nikolova N, Pavlovski Z. Major carcass parts of broiler chicken from different genotype, sex, age and nutrition system. Biotechnology in animal husbandry. 2009; 25: 1045-1054.
5. Shahin KA, AbdElazeem F. Effects of breed, sex and diet and their interactions on carcass composition and tissue weight distribution of broiler chickens. Archiv fur Tierzucht. 2005; 48: 612.
6. Cahaner A, Dunnington EA, Jones DE, Cherry JA, Siegel PB. Evaluation of two commercial broiler male lines differing in efficiency of feed utilization. Poultry Science. 1987; 66: 1101-1110.
7. Cabel MC, Waldroup PW. Effect of dietary protein level and length of feeding on performance and abdominal fat content of broiler chickens. Poultry science. 1991; 70: 1550-1558.
8. Rezaei M, Moghaddam HN, Reza JP, Kermanshahi H. The effects of dietary protein and lysine levels on broiler performance, carcass characteristics and N excretion. International Journal of Poultry Science. 2004; 3: 148-152.
9. Gonzales E, Buyse J, Takita TS, Decuypere E. Metabolic disturbances in male broilers of different strains. 1. Performance, mortality, and right ventricular hypertrophy. Poultry Science. 1998; 77: 1646-1653.
10. Abdullah AY, joup MM, Qudsieh RI, Ishmais MA. Growth performance, carcass and meat quality characteristics of different commercial crosses of broiler strains of chicken. The journal of poultry science. 2010; 47: 13-21.
11. Korver DR, Zuidhof MJ, Lawes KR. Performance characteristics and economic comparison of broiler chickens fed wheat-and triticale-based diets. Poultry science. 2004; 83: 716-725.
12. Ament AJ, Jansen J, van de Giessen A, Notermans S. Cost-benefit analysis of a screening strategy for Salmonella enteritiisin poultry. Vet. Quart. 1993; 15: 33-37.
13. Davidson S, Gallipan D, Eckert TE, Ziegler AF, Eckroade RJ. Economic analysis of an outbreak of avian influenza. J. Am. Vet. Med. Assoc. 1999; 214: 11.
14. Vaillancourt JP. How do you determine the cost-benefit of a biosecurity system? Dept. of Farm Animal Health and Resource Management, North Carolina State Univ. USA. 2001: 10.
15. Nworgu FC, Egbunike GN. Performance and nitrogen utilization of broiler chicks fed full fat extruded soybean meal and full fat soybean. Trop. Anim. Prod. Invest. 2000; 3: 47-54.
16. Alabi RA, Aruna MB. Techinical efficiency of family poultry production in Niger-delta, Nigeria. J. Cent. Eur. Agric. 2005; 6: 531-538.
17. Nahamya FH, Mukiibi-Muka G, Nasinyama GW, Kabasa JD. Assessment of the cost effectiveness of vaccinating free range poultry against Newcastle disease in Busedde sub-county, Jinja District, Uganda. Livestock Res. Rural Dev. 2006; 18: 23-27.
18. Nworgu FC. Economic importance and growth rate of broiler chickens served fluted pumpkin (Telfariaoccidentalis) leaves extract. Afr. J. Biotechnol. 2007; 6: 167-174.