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Short Communication

Growth performance of broiler under different management systems

R. Khatun, M.S. Islam, J. Alam and M.M. Rahman

Bangladesh Livestock Research Institute, Savar, Dhaka

Abstract

The experiment was undertaken to study the growth performance and meat yield characteristics of broiler on floor, slat, and cage systems and also to find out a suitable broiler rearing system. Ninety-nine broiler chicks (strain-Starbro) were allocated to three systems; cage (T1), slat (T2) and floor (T3). Each group had 3-replications of 11 birds in each. All management procedures were similar for birds under study. Broiler performance in terms of live weight gain, feed consumption, feed conversion efficiency, livability, cost affectivity, meat yield characteristics was evaluated and incidence of breast blisters were measured. The live weight gain, feed consumption, livability and cost affectivity of broiler production were better on slat system than other two management systems. Breast blisters and leg deformities were not found in birds reared on these three-management systems. The dressed yield was increased ($P < 0.05$) on slat system, moderate in cage and lowest in floor system. No significant differences ($P > 0.05$) on other meat yield traits in three management systems were observed.

Keywords: Broiler, Management system, Growth performance, Cost affectivity

Introduction

Broiler production is growing rapidly in Bangladesh as an important part of commercial enterprise. Its main advantages include low financial investment and quick return. Many factors are responsible for profitability in this sector. Proper management is the most important factor of broiler production.

According to WHO, 55gm animal protein is required per person per day but we are getting only 7.6gm (Huque, 2001). To reduce the gap between demand and supply of animal protein, broiler can play an important role. The average meat consumption in Bangladesh is 0.8 kg/year (Huque, 2001). Broiler meat is playing a major role in improving of human nutrition status. Now the broiler production has created great impact on poverty alleviation, employment and income generation to the rural youth and women.

Most of the broiler farmers in Bangladesh have not enough technical know-how to obtain maximum output from their investment. Normally broilers in Bangladesh are grown on floors using different kinds of litter materials, farmers does not rear their broilers on slat and cage. On the other hand, litter materials are not easily available in Bangladesh now, moreover, their prices are high. In this aspect, farmers can grow their broilers on cage and slat system. This will help in reducing cost of litter in one hand and environment pollution on the other. Because in the slat and cage systems, Poultry waste can easily/regularly manage which protect the environment pollution.

To economize the cost of housing and rearing materials they should be made with locally available materials. In fact, they should be strong and durable, cheaper, easy to use and clean for hygienic reasons. Several estimates suggest that the annual economic loss due to diseases is tremendous in Bangladesh. The losses are calculated at 60% of the total value of poultry (Latif, 2001). This paper is prepared by consolidating and updating research information on floor, slats and cage management system generated from experiments conducted in Bangladesh. The objectives of this research are to study growth performance and meat yield characteristics of broiler under different management systems to find out the suitable management system of broiler rearing.

Materials and Methods

Birds and their management: The experiment was conducted in poultry house of the Poultry Production Research Division of Bangladesh Livestock Research Institute, Savar, Dhaka. Ninety-nine day-old broiler (strain Starbro) chicks of either sex were reared on floor, cage and slat for 6 weeks with standard feeding and management.

Diets and water: A standard broiler starter diet having 21.28% crude protein and 2962 Kcal ME/kg was fed for first 3 weeks and a standard broiler finisher diet having 20% crude protein and 3000 Kcal ME/kg was fed for the last 3 weeks. Feed and water were supplied *ad libitum* to the birds throughout the experimental period. The amount of feed and water supplied to and refused by the birds were weighed everyday. The difference between offer and refusals of diets and water was the intake of diet and water respectively. Feed and water refusals from each pen were measured on every morning of the next day.

Experimental protocol: Ninety-nine birds were randomly allocated to three experimental systems: Cage (bamboo) system (T1), Slat system (T2) and Floor system (T3). Each treatment had three replications and each replication consisting of 11 birds. The birds were housed with a stocking density of 1 square feet/ bird on all management systems. All growth performance data (body weight, feed intake, FCR, Livability), profitability, temperature and humidity records were taken at the experimental period. After termination of the experiment, 4 birds (2 males and 2 females) weighing average of pen weight from each replicate were selected and slaughtered to observe the meat yield characteristics. Total cost was included considering expense on labour, chick, feed, litter, vaccine, medicine, electricity and interest of capital expenses.

Statistical analysis: All recorded and calculated data were statistically analyzed using analyses of variance (ANOVA) technique by a computer using a SPSS statistical computer package program in accordance with the principles of the Completely Randomized Design (Steel and Torrie, 1980).

Results and Discussion

Table 1 reveal that birds reared on slat showed the greatest weight gain, best-feed consumption than cage and floor system ($P < 0.05$) however contradict the result of Brown *et al.* 1977; Chowdhury, 2001; Veltmann *et al.* 1984. They showed that body weight, feed Consumption, feed conversion efficiency was better on floor system. Livability was also better with slat and cage system than floor system. The cost affectivity of broiler production was declined on slat system than other two systems. Cost profit ratio had 3.26:1; 2.69:1 and 2.86:1 for cage, slat and floor system. Although, FCR and feed cost better in T1 but capital cost (cage making) was higher in T1 than T2. So the total cost per bird in T1 was higher than T2. The dressed yield were increased ($P < 0.05$) on slat system, moderate in cage and lowest in floor system. No significant differences ($P > 0.05$) on other meat yield characteristics of three management systems were observed. Breast blisters and legs deformities were not found in three management systems. A positive correlation of dressed weight with live weight coincide with the findings McNally (1949); Spicknall (1955); Jaap *et al.* (1950) and Perreault and Leeson (1987); Kumar *et al.* (1992) and Keshri *et al.* (1995). They reported that dressed yield increased at heavier live weights. Sex had little effect on any meat yield characteristics. Similar meat yields recorded in male and female broilers coincide with Gray and Richardson (1988).

Table 1. Growth performance and cost affectivity of broiler production under different management systems

Parameters	Treatment			SED(LSD) value and significance
	T1	T2	T3	
Body weight (gm)	1576	1685	1417	.007*
Feed intake(gm/bird)	2966.77	3313.56	3075.26	.550*
FCR	1.88	1.97	2.17	.337*
Livability(%)	100	100	96.66	.422 ^{NS}
Feed cost/bird	37.20	38.93	37.30	.345 ^{NS}
Total cost(Tk/broiler)	62.48	62.00	63.40	.330 ^{NS}
Sale value(Tk/ broiler)	94.57	101.14	85.04	.005*
profit(Tk/broiler)	32.09	39.14	21.64	.003*
Cost profit ratio	3.26:1	2.69:1	2.86:1	

NS= Non-significant, (P>0.05); *(P<0.05)

Table 2. Meat yields traits of broiler under different management systems

Parameters	Sex	Treatments			Mean	SED(LSD) Values and Significance		
		T1	T2	T3		T	S	T×S
Live weight (g)	M	1822	1838	1603	1658	22.33	3.11	39.20*
	F	1585	1702	1399				
	Mean	1703	1770	1501				
Blood loss(%)	M	4.23	3.34	4.13	3.80	2.11	0.56	2.31 ^{NS}
	F	3.61	3.54	3.97				
	Mean	3.92	3.44	4.05				
Feather weight(%)	M	5.20	4.21	4.23	4.34	5.10	0.81	2.31 ^{NS}
	F	4.00	4.10	4.33				
	Mean	4.60	4.15	4.28				
Dressing weight(%)	M	61.21	63.78	59.82	60.26	5.73	1.65	2.94*
	F	57.57	61.13	58.10				
	Mean	59.39	62.45	58.96				
Breast meat weight(%)	M	17.28	16.23	18.34	17.25	3.14	0.99	1.83 ^{NS}
	F	17.42	17.10	17.23				
	Mean	17.35	16.66	17.78				
Head weight(%)	M	3.01	3.89	3.29	3.17	3.21	0.09	0.27 ^{NS}
	F	2.90	3.90	2.10				
	Mean	2.95	3.89	2.69				
Liver weight(%)	M	3.20	3.22	3.40	3.13	0.21	0.01	0.29 ^{NS}
	F	3.10	3.00	2.90				
	Mean	3.15	3.11	3.15				
Shank weight(%)	M	3.60	3.80	3.00	3.33	0.14	0.09	0.15 ^{NS}
	F	3.21	3.41	2.99				
	Mean	3.40	3.60	2.99				
Shank length(%)	M	7.10	7.21	6.99	7.01	0.35	0.10	0.25 ^{NS}
	F	7.00	7.10	6.70				
	Mean	7.05	7.15	6.84				
Gizzard weight(%)	M	2.01	2.11	2.24	2.09	0.18	0.12	0.27 ^{NS}
	F	2.22	2.00	2.03				
	Mean	2.11	2.05	2.13				
Viscera weight(%)	M	10.27	11.00	10.23	10.32	1.11	0.81	1.74*
	F	10.10	10.24	10.10				
	Mean	10.18	10.62	10.16				

NS= Non-significant, (P>0.05); *(P<0.05)

As hygienic and cost affectivity (dropping and liter management) aspect slat and cage system is better than floor management system for broiler rearing. But primary investment in cage management system is higher than slat system. So among these two-management systems, we were preferred slat system than cage system. But farmers may rear of their broiler in floor and cage system to take proper liter management and should made well scientific design of cage.

References

- Brown, R.H., Howell, E.S. and McLendon, B.D. 1977. A new concept of litter management for broiler production. Transactions of the American Society of Agricultural Engineers, 20:345-348.
- Chowdhury, S.D. 2001. Litter management of broiler: recent research and future research needs in Bangladesh. 2nd International poultry show and seminar (Bangladesh Branch). 90-94.
- Grey, T. and Richardson, I. 1988. Improving quality in fresh and processed poultry products. Science and the Poultry Industry. Edited by John Hardcastle. Agricultural and Food Research Council, U.K. pp. 8-9.
- Huque, Q.M.E. 2001. Poultry industry in Bangladesh and strategies for its important. 2nd International poultry show and seminar (Bangladesh Branch). 15-24.
- Jaap, R.G., Renard, M.M. and Buckingham, R.D. 1950. Dressed and eviscerated meat yields from chickens at twenty weeks of age. Poultry Science. 29:874-880.
- Kumar, A, Hasan, S.B. and Rao, R.J. 1992. Studies on the performance of broilers fed on silkworm moth meal. International Journal of Animal Sciences. 7: 227-229.
- Latif, M.A. 2001. Development strategies of livestock and poultry in Bangladesh. 2nd International poultry show and seminar (Bangladesh Branch). 27-33.
- McNally, E.H. and Spicknall, N.H. 1955. Meat yields from live dressed and eviscerated Rhode Island Red males of chicken during growth and at maturity. Poultry Science. 34:145-148.
- Perreault, N.A. and Leeson, S. 1987. Demand for breast yield to increase. Poultry Misset. 3(2): 28-31.
- Veltmann, J.R.Jr., Gardner, F.A. and Linton, S.S. 1984. Comparison of rice hull products as litter material and dietary fat levels on turkey poult performance. Poultry Science. 63:2345. Hill Book
- Steel, R.G.D. and Torrie, J.H. 1980. Principals and Procedures of statistics 2nd Ed. McGraw Hill Book Company. INC, New York.