Journal of Animal and Veterinary Advances 3 (8): 554-556, 2004

Study the Effect of Flock Size on Production and Behaviour During Growth Period of Broiler

Muhammad Ismail Rind, Nawaz Ali Shahani, Rahmatullah Rind,
Amir Bukhsh Kalhoro, Muhammad Misri Rind and Allah Nawaz Rind
Department of Poultry Husbandry, Faculty of Animal Husbandry and Veterinary Sciences,
Singh Agriculture University, Tando Jam, 70060, Pakistan

Abstract: An experiment was carriedout to examine the effect of group size on production and behaviour of broiler. 600 day-old broiler were purchased and brooded for two weeks and later randomly divided into three groups i.e. A (150), B (200) and C (250) at the beginning of 3rd week of age and housed at Poultry Experiment Station, Department of Poultry Husbandry, Tando Jam upto the completion of 6 weeks. The groups of broiler were housed under similar conditions and offered pellet feeds (iso-caloric and iso-nitrogenous). The result show that feed intake of broiler was different significantly between groups A (3.294), B (3.246) and C (3.208) kg/b, respectively. Average live body weight of broiler were significantly increased with the progress of period i.e. W3 to W6 ($P<0.01$), but the weights were not significantly different i.e. 1.846, 1.876 and 1.880 kg/b in groups A, B and C, respectively. Social behaviour results show that the average agreesion instigated by broiler under A, B and C groups were 0.6, 0.6 and 1.2 incidences/24 hrs/b ($P>0.05$). Average aggression target of broiler under group A, B, and C were 0.5, 0.9 and 1.0 incidences/24 hrs/b ($P<0.01$). Average aggression avoidance, flying and playing behaviours of broiler groups were not different significantly ($P>0.05$). Feed conversion ratios in groups A, B and C was 2.022, 1.963 and 1.944 and net profit earned was Rs. 14.250, 16.068 and 16.548 per broiler for A, B and C groups, respectively.

Key words: Broiler, flock size, production, behaviour, growth period

Introduction

Poultry farming is one of the major sub-sector of Agriculture sector and it has made rapid progress and popularity in both, rural and urban areas in recent years, Nowadays poultry farming is being converted into industry mainly by small and large flock holding farmers, landless labourers and educated un-employed persons on commercial basis.

Presently local poultry industry in playing a remarkable role in shortening the animal protein gap for human consumption. This becomes possible by working hard of most small and medium size flocks holding farmers those extending their business to large commercial farming, followed by the switch over from traditional farming to the scientific farming. According to a survey, day old commercial broilers, layers and breeding stock birds were 235.0, 14.3, 192.9 and 5.2 million, respectively that produces 190.9 metric tonnes meat and 3336.0 million eggs per annum (Anonymous, 2001), In rural areas every family member while in urban area every fifth member of the family was engaged in poultry farming. Statistics of the Sindh Province showing the different sizes of flock i.e. 1 to 10, 11 to 25, 26 to 50, 51 to 75, 76 to 100, 101 to 200, 201 to 500, etc. were kept (Anonymous, 1998). Similarly in commercial farming of broiler, layers and breeders are also being housed in various flock sizes (Hundreds and Thousands etc). Flock size of broiler farms vary which may have reasonable adverse effects on poultry housing, behaviour, mortality, income and profit etc. (Rind, 2003). This competition is seen at maximum level in the light of number of chicks and broilers produced. Keeping in view the above facts, the present study was designed to find out the effects of various group sizes on behaviour and production of broiler.

Materials and Methods

Six hundred day-old broilers were purchased, initially weighed and brooded for two weeks on floor system by using sundried wooden dust as litter, Initially pre-starer followed by stgarter and finisher pellet feeds (all iso-nitrogenous and iso-caloric) and water were offered *at labitum*. Feed refusals of each group were collected separately and weighed in the morning hours only. Broilers were vaccinated according to local schedule provided. Broiler were weighed at the end of each week and daily mortality was recorded. 10 broilers from each group were randomly selected and marked/painted with different colours on feathers, head, neck and back of each broiler for identification. Social behaviour of broiler i.e. aggression instigator, target and avoidance, flying and playing were visually monitored and recorded with the interval of 5 minutes on the established prescribed proforma by using Time Sampling Technique (Rind, 1995) during 4th week once over 24 hours.

The data collected were tabulated and analysed by using General Linear Model in Minitab Microsoft Programme, U. S. A. (M. T. B., 1992).

Results and Discussion

Feed intake: Average total feed intake of broiler (Table 1) was significantly different from each other ($P<0.05$), i.e. 3.294, 3.246 and 3.208 kg/b for A, B and C groups, respectively and interaction between groups and weeks was also found significantly different ($P<0.01$). Similar finding was reported by Goldflus, *et al.* (!997) that feed intake of broiler was decreased significantly on increaed flock sizes, (10, 14 and 18 or 22 b/m^2)

Live body weight: Average final live body weight of broiler (Table 2) was 1.846, 1.876 and 1.88 kg/b for A, B and C groups respectively ($P>0.05$) and related interaction between groups and weeks of broilewr was not different ($P>0.05$). Goldflus, et al. (1997) concluded that the total production of live brids/m2 increased significantly with increasing housing density in winter (20.62, 27.92, 34.98 and 41.48kg) and in summer (16.94, 22.01, 27.64 and 32.51 kg), respectively; while feddes, et al. (2002) housed birds at higher density (23.8 bird/m^2) produced lower body weight (1898 g) and at lower density (14.3 birds/m^2), the highest body weight (1985 g) was achieved. Hǫwever, in the present research, the effect of different flock sizes on live body weight was non-significant.

Agonistic behaviours: Average aggression initiated by broiler (Table 3) of A, B and C groups were 0.6, 0.6 and 1.2 incidences /24 hrs/b ($P>0.05$) which is partially supported by Millman and Duncan (2000 a) who noted extremely high degree of aggression in broiler breeders; while, pettit, et al. (2002) reported threats and other types of aggressive interactisn significantly lower in the moderately crowed birds.

Aggression target behaviour of broiler (Table 3) was 0.5, 0.9 and 1.0 incidence /24 hrs/b ($P>0.05$). The result is in agreement with those of McGary, et al. (2003) whose results indicated that frequency of total forced mating behavior and aggression declined with the ptogress in age of the broilers.

Aggression avoidance behaviour (Table 3) was 1.20, 1.40 and 2.70 incidence/24 hrs/b ($P>0.05$). A comparative study has also been reported by Popova, et al. (2002) who studied behaviour of 3200 broilers i.e. avoidance to aggressiveness and considered this aspect as a reliable indices for the management of the social stress in broiler.

Flying behaviour: Flying behaviour in broiler (Table 4) was 0.0, 0.1 and 0.5 incidences/24 hrs/b ($P>0.05$). The finding of Millman and Duncan (2000 b) is partially in agreement and observed different and lesser frequency of wing flapping and flying in broiler breeder in different strains.

Playing behaviour: Playing behaviour of broiler (Table 4) for groups A, B an dC, respectively was 0.3, 0.4 and 1.1 incidences/ 24 hrs/b ($P>0.05$). Offiong, et al. (2001) reported that the frequency of vice habits (pecking, threat and chasing) increased linearly as stocking density decreased and the frequency of breast blisters, hock burns and leg weakness increased as stocking density increased. There was significant decrease in the frequency of walking, dust bathing and scratching behaviours as stocking density increased.

Feed conversion ratio (FCR) and profit: FCR of broiler (Table 5) was better for C than B and A (1.944, 1.963 and 2.022, respectively). This result is partially in accordance with those of Lewis, et al. (1997), who reported that

Table 1: Average total feed intake of broiler kept under various group sizes during growing period (kg/b)

Groups			Prob.
A	B	C	
3.294	3.246	3.208	0.001

Note: Probability for Weeks = 0.001 and Weeks* Groups = 0.001

Table 2: Average final live body weight of broiler kept under various group sizes (kg/b)

Groups			Prob.
A	B	C	
1.846	1.876	1.880	0.328

Note: Probability for Weeks = 0.001 and Weeks * Groups = 0.889

Table 3: Agonistic behaviours of broiler kept under various group sizes during 4th week (Av. incidence #/24 hrs/b)

Behaviours	Groups			Prob.
	A	B	C	
Aggression instigatror	0.60	0.60	1.20	0.200
Aggression target	0.50	0.90	1.00	0.009
Aggression avoidance	1.20	1.40	1.70	0.298
Agonistic behaviour	2.30	2.90	3.90	-

Table 4: Average flying and playing behaviours of broiler kept under various group sizes (Incidence #/24 hrs/b)

Behaviours	Groups			Prob.
	A	B	C	
Flying	0.00	0.10	0.50	0.370
Playing	0.30	0.40	1.10	0.214
Total flying and playing	0.30	0.50	1.60	0.095

Table 5: Average Feed Conversion Ratio (FCR) and Economics of broilers kept under various group sizes

Parameters	Groups		
	A	B	C
Feed conversion Ratio	2.022	1.963	1.944
Profit (Rs. /b)	14.25	16.07	16.55

birds stocked at 17.0 per m2. Similarly, the net profit per broiler earned was Rs. 14.250, 16.068 and 16.548 in groups A, B and C, respectively. It was observed that the net profit per broiler was remarkably more in larger group sizes as compared to small group holders

Conclusions

It is concluded that overall feed intake was significantly reduced with the increased group size with no change in final live body weight of broiler. Smaller group size broiler was found more under aggression targets, involved more in total aggression quantities of feed to become more expensive. Larger group sizes broiler were efficiently converted feed consumed into meat (FCR) than other small group sizes and become more economical for farmers. Broiler be kept in larger group sizes to minimize various managemental costs become farming economical, broiler be kept in larger groups which may assist to minimize aggression activities and becomes stay in comfort.

References

Anonymous, 1998. Livestock Census 1996. Agricultural Census Organization, Statistics Division, Government of Pakistan, Gulberg, Lahore pp: 38.

Anonymous, 2001. Economic Survey, Government of Pakistan, Economic Advisor's Wing, Finance Division, Islamabad, pp: 27-28

Feddes, J. J. R., E. J. Emmanuel and M. J. Zuidhof, 2002. Broiler performance, body weight variance, feed and water intake and carcase quality at different stocking densities. Poultry Sci., 81: 774-779.

Goldflus, F., J. Ariki, K. S. Nascimento, N. K. Sakomura and V. M. B. Moraes, 1997. Effect of housing density during the cold and hot seasons on the performance of broilers. Revista da Sociedade Brasileira de Zootecnia 26: 948-954.

Lewis, P. D., G. C. Perry, L. J. Farmer and R. L. S. Patterson, 1997. Responses of two genotypes of chicken to the diets and stocking densities typical of UK and Label Rough production system I. Performace, behaviour and carcass composition. Meat Sci., 45: 501-516.

McGary, S., I. Estevez and E. R. Cohe, 2003. Reproductive and aggressive behavior in male broiler breeders with varying fertility levels. Applied Animal Behaviour Sci., 82: 29-44.

Millman, S. T. and I. J. H. Duncan, 2000a. Do female broiler breeder fowl display a preference for broiler breeder or laying strain males in a Y-maze test? Applied Animal Behaviour Sci., 69: 275-290.

Milliman, S. T. and I. J. H. Dunca, 2000b. Strain differences in aggressiveness of male domestic fowl in response to a male model. Applied Animal Bahaviour Sci., 66: 217-233.

M. T. B., 1992. Minitab Micro Computer Software for Statistical Analysis, U. S. A. pp: 215.

Offiong, S. A., E. S. Bamigboye and O. O. Ojebiyi, 2001. Assessment of stocking densities on the performance, behaviour and carcass characteristics of broiler chickens in the humid tropics. Global J. Pure and Applied Sci., 7: 641-645.

Rind, M. I., 2003. Poultry farming and their problems. Lecture delivered to poultry farmers at Indus Hotel, Hyderabad pp: 5.

Rind, M. I., 1995. Social effects on the feeding behaviour and production of dairy cows Ph. D. Thesis UCNW, Bangor, United Kingdom.

Pettit, R. R., I. Esteve and E. Cohen, 2002. Effects of crowding and access to perches on aggressive behaviour in broilers. Applied Animal Behaviour Sci., 79: 11-25.

Popova, R. S., V. Hadjiiliev, D. Gudev and A. Alexandrov, 2002. Reliability of well-being indicators in broilers ISSA. Bulgarian J. Agricultural Sci., 8: 233-238.