



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2020; SP-9(7): 95-98

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www.thepharmajournal.com

Received: 24-05-2020

Accepted: 26-06-2020

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Evaluation of social behaviour of Aseel chicken in different grouping systems

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Abstract

A study was conducted on 60 no's of Aseel broiler chicks reared in deep litter system. The birds were reared in three treatment groups. Different groups were trained for different time period. Social hierarchy and behavior among the three groups were assessed on the basis of Dominance Tests. The tests included Food running test, Aggression test and Runway test. The comparative evaluation among different social dominance test revealed that in food running test Group-3 (65.00%) birds showed the best performance followed by Group-1 (50.83%) and 2 (42.50%) which may be due to better response and easier stabilization of social hierarchy than rest of two groups. In aggression test, Group-2 birds showed significantly less response as compared to Group-2 and Group-3 which may be due to gradual training leads to less agonistic behaviour. There was no statistically significant difference observed between Group-2 and Group-3 birds in aggression test. In run way test no statistical difference was observed among the different groups but Group-3 birds showed a numerically better performance (60.00%) than Group-2 (56.25%) followed by Group-1 (52.25%) due to common training schedule. This study also revealed that social order usually develops in a gradual manner so that the birds will find their own niche in the hierarchy. A gradual increment in training schedule from first week onwards results in better and quicker establishment of social niche due to easier stabilization of social hierarchy.

Keywords: Social behavior, social hierarchy, social dominance

Introduction

The study of animal cognition is a growing one, with increasing dialogue among researchers in different academic fields. This has witnessed enormous growth in the last decade. modern studies of animal cognition have uncovered many fascinating facets of cognition in various species. The avian models play a vital role in studies on the neural mechanism underlying various cognitive functions, such as learning, memory, attention and consciousness (Shimizu, 2009). Training is used to help animals overcome fear (Laule *et al.*, 2003: primates), help reduce aggression in social groups (Bloomsmith *et al.*, 1994: chimpanzees)^[4], reduce abnormal behavior (Dorey *et al.*, 2009: baboons). Cognition may play a useful criterion to select bird in future breeding programme, to obtain birds with higher development capacity. Hence, the current study is designed to evaluate learning and cognitive ability of male and female Aseel birds to assess the effect of continuity in training on social behavior in broiler chickens.

2. Material Method

The research work entitled "social behavior of broiler chickens" was carried out in the Instructional Livestock Farm Complex, College of Veterinary Science & Animal Husbandry, Orissa University of Agriculture and Technology, Bhubaneswar.

Sixty no's of day-old chicks each of Aseel birds were selected as experimental birds and reared in deep litter system. Deep litter rearing arrangements were prepared 2 days prior to the arrival of chicks. The room was properly ventilated and well lighted. The deep litter house was divided into three compartments by using wire-netting compartment for the three experimental groups. All the birds are marked by using the wing band on first day. All the birds were fed as per BIS specifications.

The birds were reared in three treatment groups like Group-1, 2 and 3. In Group-1 there were 30 birds. Among them first batch 10 birds were trained for first to sixth week, second batch (10 birds) were trained for first to fourth week and third batch (10 birds) were trained for first and second week only. In Group-2, there were 20 birds. Among them Batch-IV (10 birds) were trained for third to sixth week.

Batch-V 10 birds were trained for third and fourth week. In Group III there were 10 birds i.e. Batch-VI (10 birds) were trained for fifth and fourth week only. Social hierarchy in the three groups was assessed on the basis of Dominance Tests on different test days. The tests included Food running test, Aggression test and Runway test.

Table 1: (Training Schedule)

	Birds	1 st week	2 nd week	3 rd week	4 th week	5 th week	6 th week
Group-1	Batch-I	10					
	Batch-II	10					
	Batch-III	10					
Group-2	Batch-IV	10					
	Batch-V	10					
Group-3	Batch-VI	10					

2.1 Food-running behavior

Food-running behavior study was conducted according to Cloutier *et al.* (2004) and Kruijt (1964). During the experiment piece of bread were used as the experimental diet. The piece of bread was thrown between the birds in selected group. An equal no. of pieces of bread were used every time to evaluate the dominance between experimental birds as per the specific group. When a bird would pick up the bread from the floor, at that time the particular bird was noticed. Total no. of times that each breed pick up the bread were recorded.

2.2 Aggression test

Aggression test was done as per Eath and Keeling (2003). The experimental birds were fasted for one hour during the morning feeding time. The aggressive behavior during feeding (attempt fighting, displacing, chasing, and threatening) of both breed was recorded by visual observation. Total no. of times from a particular breed showed aggression was recorded.

2.3 Run way test

The run way test was done according to the Bokkers and Koene (2004) [3]. The apparatus for the runway test was arranged in a separate room. It consisted of a start box (1.2 m x 1.2 m x 1.5 m, l×w×h) and a runway (3 m x 1.2 m x 1.5 m, l×w×h). A door was placed which separated start box from runway. One bowl was placed in the runway at 300 cm from the start box containing the food reward (feed). Before the experiment, the birds were trained individually and simultaneously to walk through the runway to obtain the food reward for several days. At first the selected birds were put in the start box then the door was opened. For the motivation to walk for a food reward birds were feed deprived continuously for 3 hours. The maximum time allowed for birds was 4 minutes to pass finish line, which is situated near about 250 cm. from the door. Total no. of birds from each breed that crosses the finish line within four minutes was observed and recorded.

3. Results and Discussion

3.1 Social dominance in Group-1 birds The social dominance tests results of Group-1 birds have been depicted in Table-2. In food running test, on first test day to third test day there was improvement in response, which slight decreased on 4th test day. The average response value stood at 50.83% in food run way test. In aggression test, an

inconsistent trend was observed, in which on 4th test day, the maximum response (40.00%) was found followed by first test day (36.67%). The aggression index (average) was found to be 34.17. In Run way test of Group-1 birds, a gradual improvement in response was observed from first test day (40.00%) to second (56.67%) and third (60.00%). On fourth test day, a slight depression (53.33%) was observed in response. The average value for the runway test was found to be 52.50%.

Table 2: (Response of Group-1 birds in different Dominance test)

Dominance test	Test Day	No of birds responded (n=30)	Percentage	Mean Percentage/index
Food Run Way test	1	13	43.33	50.83
	2	16	53.33	
	3	17	56.67	
	4	15	50.00	
Aggression Test	1	11	36.67	34.17
	2	8	26.67	
	3	10	33.33	
	4	12	40.00	
Run Way Test	1	12	40.00	52.50
	2	17	56.67	
	3	18	60.00	
	4	16	53.33	

3.2 Respond of Group-2 birds in different dominant test

The response of Group-2 birds to different social dominance tasks has been given in the Table no-3.

Table 3: (Response of Group-2 birds in different Dominance test)

Dominance Test	Test days	No of Birds responded (n=20)	Percentage	Mean percentage/Index
Food Running test	1	7	35.00	42.50
	2	8	40.11	
	3	10	50.00	
	4	9	45.00	
Aggression test	1	4	55.00	51.25
	2	8	40.00	
	3	10	50.00	
	4	12	66.00	
Run way test	1	9	45.00	56.26
	2	12	60.00	
	3	11	55.00	
	4	13	65.00	

In food running test a gradual increase and response was observed from test day-1 (35.00%) to test day-3 (50.00%). A slight depression in response was recorded on test day-4 (45.00%). The average of food running response percentage was found to be 42.50%. In aggression test, Test day-4 response was the highest (60.00%) followed by test day-1. The aggression index was recorded as 51.25, in run way test an inconsistent trend was observed in which test day-4 recorded the highest response (65.00%) followed by test day-2(60.00%). The average response for run way test was 56.25%.

3.3 Respond of Group-3 birds in different dominance test

The social dominance test response values for Group-3 birds has ben illustrated in Table.4.

Table 4: (Response of Group-2 birds in different Dominance test)

Dominance Test	Test days	No of Birds responded (n=10)	Percentage	Mean percentage/index
Dominance	1	7	70.00	65.00
	2	6	60.00	
	3	7	70.00	
	4	6	60.00	
Aggression test	1	6	60.00	47.50
	2	4	40.00	
	3	5	50.00	
	4	4	40.00	
Run way test	1	5	50.00	60.00
	2	6	60.00	
	3	7	70.00	
	4	6	60.00	

A fairly similar result was observed among the different test days in food running test. The average response to food running test was found to be 65.00%. In aggression test, test day-1 recorded the best response (60.00%). The aggression index was recorded to be 47.50. In run way test, maximum response was observed on 3rd test day. From first to third test day response for run way test gradually and consistently increased. The average response for run way test was found to be 60.00%.

3.4 Comparative response of different group of birds in different test

The comparative evaluation among different social dominance test is given in Table-5, which revealed the following findings. In food running test Group-3 (65.00%) birds showed the best performance followed by Group-1(50.83%) and 2 (42.50%). In aggression test Group-2 birds showed significantly less response as compared to Group-2 and Group-3. There was no statistically significant difference observed between Group-2 and Group-3 birds in aggression test. In run way test no statistical difference was observed among the different groups but Group-3 birds showed a numerically better performance (60.00%) than Group-2 (56.25%) followed by Group-1 (52.25%).

Table 5: (Comparative Response of different Group of birds in different Dominance test)

Dominance Test	Food running test	Aggression test	Run way test
Group-1	50.83	34.17	32.50
Group-2	42.50	51.25	56.25
Group-3	65.00	47.50	60.00

4. Discussion

Social hierarchy and behavior were assessed on the basis of food running test, aggression test and run way test. In food running test, there was gradual increase in the response from test day-1 to test day-3 in Group-1 birds. This might be attributed to better behavioral expression arising out of enhanced response to external stimuli i.e. provision of feed. The depression in response on 4th test day might be due to better socialization and recognition of own status in already established social hierarchy or pecking order. Similar trend was also evident in Group-2 and Group-3 birds. In comparative evaluation of food running test it was observed highest response in Group-3 birds followed by Group-1 and 2. As Group-3 birds had 10 birds in one pen hence there might be better response and easier stabilization of social hierarchy than rest of two groups. Moreover all the birds in Group-3 were equally trained with same schedule. In Group-2 as the birds were trained after 2 weeks some sort of social hierarchy

had already been initiated. Training schedule was different for 2 batches in Group-2 birds where some birds were trained from 2nd to 6th week whereas rest birds were trained only during 2nd and 3rd week. This schedule might have disturbed the social hierarchy that was prevailing. All these phenomena might have led to a lesser degree of response in Group-2 birds. In Group-1birds gradual induction of training from first week to sixth week might have helped in gradual establishment of social hierarchy.

In Aggression test on test day-1, all the birds irrespective of groups showed higher aggression which might be attributed to non establishment of social hierarchy. From test day2 to test day-4 there is an inconsistent and drastic drop indicated along all the groups. This might be due to gradual establishment of pecking order and socialization of experimental birds. In comparative evaluation of aggression test Group-3 birds showed lesser aggression which might be due to lesser no of birds and common training schedule. In Group-2 birds as the birds were trained from 3rd week onwards after initiation of pecking order establishment. Least aggression was observed in Group-1 birds i.e. the group in which there was gradual induction of training. This might have helped the individual birds to identify their own social niche and correspondingly reducing agonistic behavior.

In Run way test, there was gradual enhance in response from test day-1 to test day-3 in Group-1 birds. This might be due to the fact that social order usually develops in a gradual manner so that the birds will find their own niche in the hierarchy. Moreover a gradual increment in training schedule from first week onwards along the three batches could have helped in better and quicker establishment of social niche. In Group-2 birds from test day-1 to test day-2 there was drastic increase in the response of run way test. As the birds were trained from 3rd week onwards with two different schedules a slightly lesser response was observed in test day-3. By the 4th test day social hierarchy was almost finalized and established in the group leading to a higher response. The trend of response in Group-3 birds to Run way test was almost similar to Group-1 birds which might be due to common training schedule among all the birds.

5. Conclusion

The result of dominant tests from the present study revealed a better composed social hierarchy would be established when the birds are reared under similar management condition. Any disturbances or intervention put during the establishment of social hierarchy might have altering and manipulating effect on social order. The most recent training and managerial practices strongly affects the behavioral expression and cognition level of birds. Birds can be trained preferably as

early as possible to have a better result on learning and cognitive performance. Intermittent training does not necessarily give better performance. There is no single best method to the study the animal cognition or social behaviour. There is still much work and experiments to be done on domestic species. The current work is just a tiny sampling of these experiments. Advances will be made when researchers come together from a variety of backgrounds and more theoretical approaches.

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