

Some Behavioral Traits of American Bronze and White (California) Turkeys Grazing on Pasture

Ali Karabayir, Cemil Tolu and I. Erbil Ersoy

Department of Animal Science, Faculty of Agriculture,
Canakkale Onsekiz Mart University, 17020, Canakkale, Turkey

Abstract: In this study, grazing, locomotor activity, lying, standing, feather pecking, sexual activity, drinking and aggressive pecking of American bronze and white (California) turkeys were investigated. Twenty bronze (10 male, 10 female) and 20 white (10 male, 10 female) turkeys were used. Observation of behavioral traits of turkeys was carried out once every 2 weeks between 10:00-13:00. Recording of the traits was made at 10 min intervals using Time-Sampling method. The data of bronze turkeys for 9 weeks (August-September) and of white turkeys for 4 weeks (October-November) were used in the evaluation of observations. Throughout observation period, 65% of female and 59% of male bronze turkeys displayed grazing behavior, while it was 74% in white turkeys. The difference between the 2 sexes in bronze turkeys was statistically significant ($p<0.01$). Of bronze turkeys, 18% of females and 22% of males showed lying behavior, on the other hand 12% of white turkeys showed the same behavior. The difference in this behavioral trait between males and females of bronze turkeys was found significant ($p<0.05$). Aggressive pecking behavior was the least observed trait in bronze turkeys by 0.06 and 0.3% for females and males, respectively and 0.4% for white turkeys. On the day of observation, though the difference between males and females of bronze turkeys was not significant, it was significant in white turkeys ($p<0.01$).

Key words: Bronze Turkey, grazing behavior, locomotor activity, aggressive pecking, Turkey

INTRODUCTION

The domestic animals raised on pasture may exhibit some of the behaviors of their ancestors, which they exhibit in natural life, more than the animals raised indoors. Since, the number of animals per unit area is low, the ratio of individuals, which seem to be strong in the population, of affecting other animals negatively is also lower and animals can move more easily (Martin *et al.*, 1997; Cornetto *et al.*, 2002; Esteveza *et al.*, 2002; Anderson *et al.*, 2004; Moesta *et al.*, 2008). In this study, particularly the recessive animals in the population may consume more food, drink more water and perform normal behavior. Furthermore, cannibalism, confronted frequently in intensive production, remains rather low in animals raised on pasture (Savas and Samli, 2000; Odén, 2003; Riber *et al.*, 2007; Rodenburg *et al.*, 2008).

MATERIALS AND METHODS

The animal material is composed of 20 bronze (10 males, 10 females) and 20 white (female) turkeys.

With lighting in addition to daylight, a total of 23A:1K lighting program was applied to the turkeys. Upon return from the pasture, the turkeys were given ad libitum whole wheat.

Some behaviors of the turkeys (bronze and white) on pasture such as Grazing (G), Locomotor Activity (LA), Lying (L), Standing (S), Feather Pecking (FP), Sexual Activity (SA), Drinking (D) and Aggressive Pecking (AP) were observed once in 2 weeks between 10:00 a.m. and 1:00 p.m. In the study, where Time-Sampling method was applied, the behavioral traits observed once every 10 min during a 1 h observation were recorded (Bessei, 1980). Since, aggressive pecking is a short-lasting behavior, it was recorded at the moment it was observed. In the evaluation of observations, the available data of bronze turkeys for nine weeks (August-November) and the available data of white turkeys for 4 weeks (October-November) were used.

The frequency values found out concerning the behaviors other than aggressive pecking were turned into the ratio of occurrence per unit time (D%) by means of the following equation.

$$D\% = \frac{Df}{t/10} \times 100$$

where,

Df = Frequency of the behavior concerned.

t = Time in minutes.

The mean of behavioral frequencies of each individual on the observation day was analyzed by the repetitive linear model. In bronze turkeys, gender was also regarded as a constant factor in the model in addition to the observation day.

RESULTS AND DISCUSSION

During the evaluations on pasture, the grazing behavior was observed to be 65% in females whereas it was 59% in males among bronze turkeys during daily observation while it was observed to be 74% in white turkeys (Table 1). When Table 2 is examined, it is observed that this difference observed between males and females is statistically significant ($p < 0.01$). While, the grazing behavior of bronze turkeys fluctuates within the first 6 weeks, it is striking that this behavior tends to increase as of the 6th week (Fig. 1). In white turkeys, however, an increase is observed between 1st-2nd and 3rd-4th weeks while a decline is observed in the 2nd-3rd week (Fig. 2).

Table 1: The behavioral traits phenotypic means (\bar{x}) and standard deviations (S_x)

Traits	Bronze				White	
	Male		Female		Female	
	\bar{x}	S_x	\bar{x}	S_x	\bar{x}	S_x
G (%)	59.0	49.19	65.0	47.61	74.7	43.43
LA (%)	2.9	16.96	3.0	17.13	2.2	14.74
L (%)	22.4	41.70	18.3	38.75	12.6	33.24
S (%)	8.3	27.73	6.5	24.73	6.7	25.07
FP (%)	4.0	19.77	3.5	18.58	2.3	15.18
SA (%)	0.6	7.83	0.1	4.3	0.2	5.26
D (%)	0.7	8.57	0.9	9.8	0.4	6.95
AP (%)	0.3	5.54	0.06	2.4	0.4	6.95

Table 2: The means of frequency belong to observation day of each bronze and each white turkey and significant levels

Traits	Bronze			White
	Observation day	Gender	Observation day×Gender	Observation day
G	***	**	***	***
LA	***	ns	***	***
L	***	*	**	***
S	***	*	*	***
FP	***	ns	*	*
SA	**	*	ns	**
D	**	ns	ns	*
AP, %	ns	ns	ns	**

***: $p < 0.001$, **: $p < 0.01$, *: $p < 0.05$, NS: Not significant

In terms of time, the grazing behavior was followed by lying behavior. Observed to be 18% in females and 22% in males of bronze turkeys, the lying behavior was observed to be 12% in white turkeys (female) (Table 1). When Fig. 2 is examined, it is observed that bronze turkeys rather display the lying behavior between 1st-2nd, 3rd-4th and 6th-7th weeks. On the other hand, a decline was observed in the occurrence frequency of this behavior between the 2nd-3rd and 4th-6th weeks and as of the 7th week (Fig. 1). In white turkeys, however, an obvious decline is observed between the 1st and the 2nd weeks whereas it is striking that the occurrence frequency of this behavior is almost the same in the 3rd and 4th weeks (Fig. 2).

In white turkeys, the significant relationship between the observation day and all the behavioral traits studied was encountered in the behaviors other than aggressive pecking in bronze turkeys. A significant relationship was observed between gender and the behaviors such as grazing, lying, standing and sexual activity in bronze turkeys whereas it was observed that the behaviors such as locomotor activity, feather pecking, drinking and aggressive pecking did not change according to gender (Table 2).

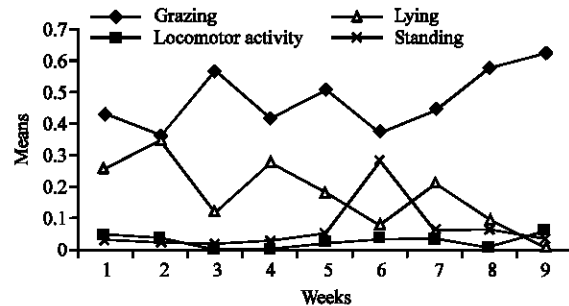


Fig. 1: Weekly changes of the behavior in bronze turkeys

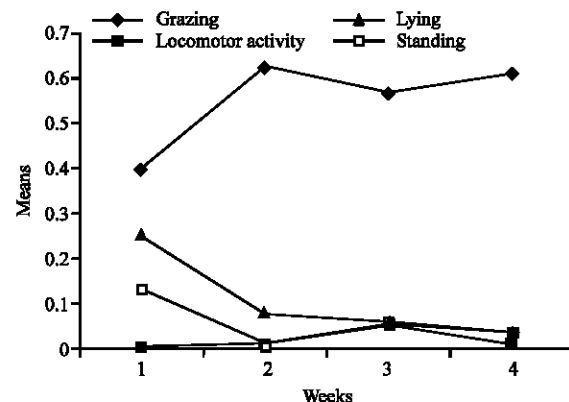


Fig. 2: Weekly changes of the behavior in white turkeys

Among the behavioral traits studied, standing is another striking behavior in terms of time. During the observations, 6.5% of the females and 8.3% of the males in bronze turkeys and 6.7% of the white turkeys (female) spent much of their time by standing (Table 1). The bronze turkeys displayed a similar tendency in terms of the standing behavior in the weeks except for between the 5th and the 7th weeks (Fig. 1). In white turkeys, an obvious decline was observed between the 1st and the 2nd weeks in terms of the standing behavior while no significant changes were observed among the other weeks (Fig. 2). On the other hand, it was observed that there were no significant changes among weeks in terms of the other behaviors found out.

The grazing behavior was performed at a higher level than the other behavioral traits studied in both genotypes. It is observed that the grazing behavior of females among bronze turkeys is higher than that of males and that the difference between them is statistically significant as well ($p < 0.01$). On the other hand, when an evaluation is made in terms of females, it is observed that the occurrence frequency of this behavior is higher in the white genotype than the bronze genotype. These findings support the studies of Martin *et al.* (1997), Cornetto *et al.* (2002), Esteveza *et al.* (2002), Anderson *et al.* (2004) and Moesta *et al.* (2008). The difference observed between genotypes in terms of the grazing behavior can be suggested to be caused by the differences of age of turkeys used in the experiment and by the fact that the turkeys concerned were included in the experiment at different periods since the white genotype was included in the experiment 5 weeks later than the bronze genotype. In white turkeys, grazing was at a higher level since the period, when observations were carried out, coincided both the period, when the growth speeds of turkeys were higher and the days when the weather was cooler.

The turkeys spent much of their time by lying during the period when they did not graze. When male and female bronze turkeys were compared in terms of the lying behavior, this behavior was observed more frequently in males. In terms of this behavior, the difference between males and females was found to be statistically significant ($p < 0.05$). Moreover, between the genotypes, the white turkeys are observed to tend to lie less. In bronze turkeys, males stand longer than females and the difference between them is found to be statistically significant ($p < 0.05$). There is no significant difference between genotypes in terms of this behavior.

Observed frequently among the poultry raised both freely and in cage indoors and causing considerable economic losses, cannibalism (Savas and Samli, 2000; Odén, 2003; Riber *et al.*, 2007; Rodenburg *et al.*, 2008) was

rather at a low level in this study where raising was carried out on pasture. However, white turkeys displayed a significantly high level of aggressive pecking ($p < 0.01$) in comparison to bronze turkeys. The low level of cannibalism, which occurred as a result of animals' pecking each other, in this raising system can be explained by the low number of animals per unit area since the frequency of settlement ranks the top of the most important factors leading to cannibalism and as the number of animals per unit area increases, the risk of cannibalism increases, too (Odén, 2003).

It can be stated that the other behavioral traits studied did not cause any differences neither between genders nor genotypes and that they had a similar tendency.

CONCLUSION

This study puts forth that the turkeys raised outdoors spend much of their time by grazing and that aggressive pecking, included among the most important reasons for cannibalism, is rather low. Furthermore, it also puts forth that turkeys change some of their behaviors according to differences in the raising system.

REFERENCES

- Anderson, K.E., G.S. Davis, P.K. Jenkins and A.S. Carroll, 2004. Effects of Bird Age, Density and Molt on Behavioral Profiles of Two Commercial Layer Strains in Cages1. *Poult. Sci.*, 83: 15-23.
- Bessei, W., 1980. Untersuchungen über Furcht und Scheu bei Hühnern. Verhalten von Hühnern. In: Hrsg. S. Scholtyssek Hohenheimer Arbeiten 108, Verlag Eugen Ulmer, pp: 35-50.
- Cornetto, T., I. Esteves and L.W. Douglass, 2002. Using artificial Cover to reduce aggression and disturbances in domestic fowl. *Applied Anim. Behav. Sci.*, 75: 325-336.
- Esteveza, I., R.C. Newberry and L.J. Keeling, 2002. Dynamics of aggression in the domestic fowl. *Applied Anim. Behav. Sci.*, 76: 307-325.
- Martin, F., J.P. Beaugrand and P.C. Laguë, 1997. The role of recent experience and weight on hen's agonistic behaviour during dyadic conflict resolution. file:///C:/Documents and Settings/Administrator/My...ents/publications/Martin-Beaugrand-Lague-1997b.htm(14of14) [11/30/2001 18: 19: 20].
- Moesta, A., A. Bries, U. Knierim and J. Hartung, 2008. Behaviour of laying hens in aviaries-review. Part 2: Feeding behaviour, reproductive and dust bathing behaviour. *Deutsche Tierärztliche Wochenschrift*, 115 (1): 4-14.

- Odén, K., 2003. Fear and Aggression in Large Flocks of Laying Hens Effects of sex composition. Doctoral thesis Swedish University of Agricultural Sciences, Skara.
- Riber, A.B., A. Wichman, B.O. Braastad and B. Forkman, 2007. Effects of broody hens on perch use, ground pecking, feather pecking and cannibalism in domestic fowl (*Gallus gallus* domesticus). *Applied Anim. Behav. Sci.*, 106 (1/3): 39-51.
- Rodenburg, T., B.H. Komen, E.D. Ellen, K.A. Uitdehaag and J.A.M. van Arendonk, 2008. Selection method and early-life history affect behavioural development, feather pecking and cannibalism in laying hens: A review. *Applied Anim. Behav. Sci.*, 110 (3/4): 217-228.
- Savas, T. and H.E. Samli, 2000. Tavuklarda Agresyon ile Sosyal Hiyerarşinin Yumurta Verimi ve Bazı Davranış Özelliklerine Etkisi. *Tarım Bilimleri Dergisi*, 6 (1): 11-15.