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Growth Performance of Big-6 Broiler White Turkeys in the Different Rearing Conditions

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Abstract: This study was conducted to determine the effect of rearing partially outdoor and indoor conditions on growth rate and carcass yields of Big-6 heavy white Turkeys. Totally 144 white toms were divided into 3 groups (Pasture-1, Pasture-2 and Control) with 6 replicates, randomly. Pature-1 (P1) and Pasture-2 (P2) had outdoor access from 42 and 49 days old till end of the trail, respectively, while control group was kept indoor. All birds consumed commercial Turkey breeding feed. At the end of trial, no significant differences were observed in terms of body weight but the best one was the control group. The lower feed consume and the best feed to gain was observed in P1 (3.06) and P2 (3.56) then control group (3.73), which was significantly different ($p<0.05$). Outdoor access did not have significant effect on carcass weight, breast meat and legs (Thights + drumstick) but it differed the wings ($p<0.05$). As a result, it has been said that Big-6 heavy Turkeys have to be fed inside without outdoor access so far. According to results of present study, one may say that Big-6 white turkey could be grazed with no deleterious effect on growth performance. However, more study is needed to determine age of access to outdoor and growth performance of Big-6 white Turkeys at different grazing fields.

Key words: Big-6 Turkey, growth performance, grazing field, Turkey, breast meat, rearing condition

INTRODUCTION

Turkey is an important poultry species reared for meat production. Many feeding regiments were practiced to reduce expense of turkey meat. One of them is grazing turkeys because it is cheaper than feeding with grains. Animals grazing pastures have more fiber than fed with grain. In pasture, it has been assumed that fiber is not digested by poultry however, some investigations have indicated that increased level of fiber may improve performance of chicks (Ricke *et al*., 1982). A study indicated that cellulose is at least partially fermented in caeca of Turkey. Even reduced the feed efficiency, 9% cure fiber in the diet did not change growth of 6-10 weeks old Turkey (Leeson *et al*., 1997). On the other hand, a study has shown that in the gastro intestinal tract of turkey hens, part of the cure fiber can be utilized from rations containing 60 g kg^{-1}, or more without any decrease in feed efficiency. This study suggests that high fiber dietary components can be used in Turkey rations (Sklan *et al*., 2003). In Turkey, hens were grazed from 8 weeks old till 16-24 weeks old and those are American Bronze and/or their crosses (Sonmez *et al*., 1971; Kocak *et al*., 1990; Karabulut *et al*., 1990; Sarica *et al*., 1991; Sengul, 2001). The studies showed that pasturing turkeys has advantage in terms of feed intake (Karabulut *et al*., 1990). Growing performance of British United Turkeys commercials strain (BUT Big-6) in pasture is not clear yet because BUT Big-6 hens are mostly fed with diet containing grain in cages in Turkey. Therefore, the effect of rearing partially outdoor and indoor conditions on fattening performance of BUT Big-6 was investigated.

MATERIALS AND METHODS

This study was conducted at the University of Yuzuncu Yil, Agricultural Faculty Research Farm from May-September 2003. All pullets were obtained from a commercial hatchery and vaccinated for Marek's disease, infectious bronchitis and Newcastle disease. All poults were wing banded and weighted. Totally 144 male pullets were kept together till 42 days old then assigned to three groups (Control, Pasture-1 and Pasture-2) with 6

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replicates containing 8 poults each, randomly. Pullets were reared in total 18 floor pens (1.3×3 m) on wood shaving in an experimental unit with 23 h lighting and 1 h dark. The poults were fed a commercial starter diet based on corn and soybean meal (28% crude protein and 2850 kcal kg^{-1} ME) from a days old to 5 weeks old. Temperatures of the experimental unit was maintained at 35±1°C during the first week and gradually decreased to 21°C till 3 weeks of age. During the trail, control group was kept inside until end of the experiment. Pullets of Pasture-1 (P1) were allowed to outdoor access from age of 42 days old till end of trail for grazing pasture during the day light hours then were confined to indoor pens at night and fed with a diet consumed by control group.

Pullets of Pasture-2 had as same condition as P1, only the difference was the age (49 days old) to allow outdoor access. All the birds fed by same commercial diet based on corn and soybean meal with 20 crude protein and 2950 kcal kg^{-1} ME, 18% crude protein and 3000 kcal kg^{-1} ME and 15% crude protein and 3100 kcal kg^{-1} ME from 5-8 weeks of age from 9-12 weeks of age and 13-16 weeks of age, respectively. Access to feed and water was freely available and all diets were formulated to contain adequate nutrient levels as defined by the National Research Council.

Birds and feed were weighed by weekly and individually to determine weight gain, feed intake and feed efficiency. Turkeys were slaughtered at 16 weeks of age and commercially processed at the slaughter-house of Agricultural Faculty. Feed was withdrawn for 10 h before slaughter and Turkeys were weighed individually to get live weight at the plant. After bleeding, animals were scalded in 50°C for 120 sec, picked with automated equipment and eviscerated by hand. Carcasses were pre chilled at 12°C for 17 min and chilled 1°C for 60 min. After chilling process, the carcasses were aged on ice for 5 h and separated for the parts. Carcass yield, breast, back, wings, legs (thighs and drumsticks) were recorded. Abdominal fat was removed and weighed.

The data were analyzed using the GLM procedure of a statistic packed program. Live weight, feed intake, feed conversion rate and carcass characteristics were studied by analysis of variance including the effect of rearing conditions. When the F-test was significant, the least mean square were compared by using Duncan's multiple range test. The level at which differences were considered significant was $p<0.05$.

RESULTS AND DISCUSSION

Performance of the toms during the 6-16 weeks of age is shown in Table 1. Fast-growing Turkeys have been selected for rapid early growth and reach this market weight in about 14-F and 16-M weeks. As in conventional production, market body weight of male British United Turkeys commercial strain (BUT big-6) is about 12-13 kg at the end of 16 weeks of age. This study has shown that outdoor access did not differ body weight gain because the differences between control and treatment groups were not significant, even the control group was heavier than Pasture-1 and Pasture-2. Fanatico *et al.* (2005) reported that broilers raised outdoors have access to pasture and the various forages, insects and worms which may be available. Free-range housing systems of Turkeys did not have significant effect on weight gain (Sarica *et al.*, 2009).

Table 1: The Least Square means (X), Standard error (S) and significant level of body weight (g) of Turkeys at different age

	Body weight (g)		
Age (week)	Control	Pasture-1	Pasture-2
	X±S		
6	3733±140.56[a]	3725±150[a]	3730±149.2[a]
7	4350±135.26[a]	4334±145.86[a]	4345±145.87[a]
8	5125±150.39[a]	5120±152.6[a]	5126±14.59[a]
9	6138.65±108.60[a]	6199.68±150.75[a]	6112.40±154.02[a]
10	7125.22±133.68[b]	7077.70±185.56[ab]	7385.91±189.59[a]
11	8352.07±155.75[a]	8336.73±216.20[a]	8541.33±220.89[a]
12	9381.69±168.45[a]	9233.11±230.80[a]	9316.74±253.18[a]
13	10360.71±207.67[a]	10033.80±282.90[a]	10223.06±288.81[a]
14	11375.98±236.98[a]	11140.08±334.02[a]	11402.22±330.30[a]
15	12426.83±437.14[a]	11351.93±516.14[a]	12090.47±509.28[a]
16	12478.78±312.69[a]	12361.75±440.74[a]	12378.75±453.83[a]

[a,b,c]Means in rows not followed by the same superscript differ significantly ($p>0.05$)

Table 2: Feed intakes (g) and feed efficiencies of Turkeys at different age

	Age (11-17 weeks)	
Groups	Feed intake (g $bird^{-1}$)	Feed efficiency (g feed:gain)
Control	19968±546[a]	3.73±0.146[a]
Pasture-1	18547±679[b]	3.51±0.095[a]
Pasture-2	16276±815[c]	3.06±0.128[b]

[a,b,c]Means in column not followed by the same superscript differ significantly ($p>0.05$)

The results in this study in terms of body weight agree with those reported by Fanatico *et al.* (2005) and Sarica *et al.* (2009) who noted that outdoor access did not have an effect on weight gain in broilers and Turkeys. It was expected that the performance of pullets with outdoor access would be worse than that of pullets in a more controlled environment because the outdoor birds would be exposed to fluctuating temperatures and increased exercise in yards (Sarica *et al.*, 2009). On the other hand, lower growth rates and feed efficiency with outdoor organic treatment than with conventional one were reported by Castellini *et al.* (2002) while higher growth rate, lower feed consume and feed efficiency with semi-restricted than restricted treatment were observed (Santos *et al.*, 2005). Isguzar (2002) found the mean body

Table 3: The carcass weight (g) and parts cut-up characteristics of turkeys

Groups	Carcass weight	Breast	Thights + drumstick	Wing
Control	9721.80±498.35[a]	3305.19±159.63[a]	2261.26±136.57[a]	1101.66±42.85[b]
Pasture-1	10958.47±519.88[a]	3075.13±193.97[a]	2410.17±179.02[a]	1258.72±52.07[a]
Pasture-2	9858.66±576.76[a]	2946.34±177.31[a]	2527.12±151.51[a]	1233.09±47.60[a]

[a,b,c]Means in column not followed by the same superscript differ significantly ($p>0.05$)

weight of white Turkeys as 18600 g at the end of 18 weeks which is heavier than the turkeys, it is probably due to longer (18 weeks) fattening period. According to results of study, it may be said that pasturing did not change fattening period of the Turkeys in terms of body weight gain. Similar body weights were also reported in different study (Moran *et al*., 1970).

Feed Conversion Ratio (FCR) and feed consumed 11-17 weeks were 3.51±0.095 and 18547±679 g, 3.06±0.128 and 16276±815 g, 3.73±0.146 and 19968±546 g for Pasture-1, Pasture-2 and Control groups, respectively (Table 2). Pasturing birds had an effect on feed intake and feed efficiency. The least mean of feed intake and feed efficiency differences between control and Pasture-2 were significant ($p<0.05$). These results are not consistent with those reported by Fanatico *et al.* (2005) and Sarica *et al.* (2009).

They reported that outdoor access did not have an effect on weight gain, feed intake and feed efficiency in broilers and Turkeys. Sarica *et al.* (1991) noted that the performance of birds with outdoor access would be inferior to that of birds in a more controlled environment because the outdoor birds would be exposed to fluctuating temperatures and increased exercise in yards. Besides, Castellini *et al.* (2002) reported that lower growth rates and feed efficiencies with outdoor organic treatments than with conventional production systems. However, semi-confined birds showed higher growth rate, lower feed intake and better feed efficiency than confined birds (Santos *et al*., 2005).

Results of the study were agreed with Santos *et al.* (2005). These contradictions in the findings might have been due to differences in the experimental approach and the system of production. Sarica *et al.* (2009) interpreted the differences of results of their study and study of Fanatico *et al.* (2005) that all birds were actually exposed to the same temperature fluctuations because the treatments shared a common research facility, a building that is naturally ventilated.

In addition, the trial was conducted in the spring and early summer when the weather was mild and did not fluctuate widely, which is same as the breeding condition. A research indicated that breast and drumstick meat yield of broiler increased when the birds had outdoor access and a lower stocking density in an organic production system (Castellini *et al*., 2002). However, Sarica *et al.* (2009) reported that even though stocking density was lower (1.8 birds per m^{-2}) in the treatments with outdoor access, there was a deleterious effect of free range housing system on yields of carcass and drumstick.

In the present study, no significant differences were found in terms of carcass weight, breast and legs (drumstick + thighs) in the treatments with or without access to outdoor (Table 3). However, breast meat tended to higher in control than treatment with outdoor access. This might be due to availability of more activity in outdoor access than indoor. In deed, the wings were heavier in the treatment with outdoor access than control group, which is indicating that the more activity, the more wing weight could be.

CONCLUSION

As a result, it has been said that Big-6 heavy turkeys have to be fed inside without outdoor access so far. According to results of present study, one may say that Big-6 white turkey could be grazed with no deleterious effect on growth performance. However, more study is needed to determine age of access to outdoor and growth performance of Big-6 white turkeys at different grazing field.

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