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Effects of housing system, slaughter age, and sex on slaughter and carcass traits of native Turkish ducks

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Abstract: The purpose of this study was to determine the effects of different housing systems, slaughter age, and sex on slaughter and carcass traits of native Turkish ducks. A total of 133 ducklings were used. One-day-old ducklings were divided into 2 housing groups, a cage system and a deep litter floor system, under uniform conditions. Housing system significantly affected hot carcass, cold carcass, breast, wing, neck, and back percentages ($P < 0.05$, $P < 0.01$, and $P < 0.001$). The results of the current study showed the influence of housing system, sex, and slaughter age on slaughter and carcass traits. The slaughter and carcass traits and feed conversion efficiency were higher in the deep litter floor system than in the cage system for native Turkish ducks. The slaughter and carcass traits of male ducks were higher than those of female ducks. The ideal slaughter weight for native Turkish ducks was reached at 8 weeks, whereas the results for hot carcass weight, cold carcass weight, hot carcass percentage, and cold carcass percentage were better at 10 weeks of age. Therefore, it seems most appropriate to slaughter native Turkish ducks at 10 weeks of age.

Key words: Duck, housing system, sex, slaughter age, slaughter and carcass traits

1. Introduction

Native Turkish ducks are raised primarily for meat, eggs, and feathers. Native duck genotypes have been extensively raised for many years on family farms in some regions of the country. However, since we have no statistical data on duck breeding potentials in Turkey, it is only known that there are very few small-scale duck farms raising ducks (1,2). Ducks are easily raised and they are hardy and less susceptible to many of the common poultry diseases such as leucosis, Marek's disease, infectious bronchitis, and other respiratory troubles (3,4).

Ducks have been housed in 3 different systems. These are intensive, semi-intensive, and open range systems. The intensive system could either be the deep litter floor or the cage system. In these systems, similar to chicken housing systems, the ducks are kept in an enclosed room on litter with proper ventilation (5). There is not enough information about the effects of different housing systems, sex, and slaughter age on slaughter and carcass traits in native Turkish ducks. However, the best slaughter age for Pekin ducks has been accepted as 7 to 8 weeks (6). There is little research on the different housing systems for Pekin ducks in Turkey (7,8). No research has been conducted to demonstrate the advantages and disadvantages of deep litter floor and cage systems on slaughter and carcass traits in native Turkish duck production.

The purpose of this research was to determine the effects of different housing systems, sex, and slaughter age on slaughter and carcass traits of native Turkish ducks.

2. Materials and methods

This study was carried out on the Kafkas University Research Farm. Animal materials included both male and female native Turkish ducks. In the present study, 133 one-day-old ducklings were placed in brooder batteries with 24 h of light. All ducklings were kept under the same conditions. Then the 1-day-old ducklings were transferred into a shelter run, with both sexes together. A total of 64 ducklings of similar weights were reared in the deep floor pens. About 8–10 cm of wood shavings was used as litter on the floor. The stocking density in the deep litter system was 4 ducklings per m^2 (9). A total of 69 ducklings of similar weights were reared in the cage system. Nine standard cages (1 m × 2 m × 85 cm) were used with a stocking rate of 7–8 ducks per cage (9). After the second week, the daily photoperiod consisted of 16 h of light and

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8 h of darkness. The coop temperature was 32–34 °C in the first week, and thereafter it was decreased by 3–5 °C per week until it reached 19–20 °C at 4 weeks. By this point, the ducklings were fully feathered. All ducklings were fed a starter diet of 22% crude protein (CP) and 3000 kcal/kg metabolizable energy until they were 5 weeks old. Thereafter, until the experiment ended at the age of 12 weeks, they were fed a grower diet with 18% CP and 3100 kcal/kg (Table 1) metabolizable energy, as recommended for ducks by the National Research Council (10). Food and water were offered ad libitum. The experimental period lasted 12 weeks.

Mortality was monitored daily. Feed consumption quantities and food conversion ratios in the deep litter floor and cage systems were determined for males and females at 8, 10, and 12 weeks of age. Slaughter weight was recorded at 8, 10, and 12 weeks of age. Sixty ducks (30 male and 30 female) from each housing system were slaughtered 12 h after their last meal, with 20 slaughtered at 8 weeks of age, 20 slaughtered at 10 weeks, and the remaining 20 slaughtered at 12 weeks. A total of 120 ducks were slaughtered. After bleeding, the carcasses were scalded for approximately 1 min at 65 °C, plucked, and eviscerated. The hot carcass weights were recorded to determine carcass percentage. The carcasses were stored at 4 °C for 24 h, at which point the cold carcass weight and the weights of leg, breast, wing, neck, and back were recorded. Cold carcass percentage was calculated as the ratio between cold carcass weight and slaughter weight. The carcasses were cut into parts as described by Pingel et al. (11) and Barbut (12).

The data were analyzed using the least squares mixed model procedures of SPSS 12.0 (13). The traits measured on the ducks were analyzed based on the fixed effects of housing system (deep litter floor and cage systems), sex (male and female), and age of slaughter (8, 10, and 12 weeks). Duncan's multiple comparison tests were used to evaluate the significance of the differences among the groups in slaughter age. Survival rate was evaluated using the chi-square test. There were no differences in female and male feed efficiency and survival rate, because the sexes of the samples were not considered in the analysis.

The model used to analyze the slaughter and carcass traits was:

$$Y_{ijkl} = \mu + a_i + b_j + c_k + e_{ijkl},$$

where, for duck slaughter and carcass traits, Y_{ijkl} is the traits, μ is the overall mean, a_i is the effect of housing system (deep litter floor and cage systems), b_j is the effect of sex (male and female), c_k is the effect of slaughter age (8, 10, and 12 weeks) and e_{ijkl} is the random residual.

3. Results

The main effects and interactions of different housing systems, sex, and slaughter age on slaughter traits of native Turkish ducks are presented in Table 2. Housing system, sex, and slaughter age significantly affected the slaughter, hot carcass, cold carcass, head, foot, heart, and gizzard weights ($P < 0.05$, $P < 0.01$, and $P < 0.001$). The mean slaughter, hot carcass, cold carcass, head, foot, heart, and gizzard weights of the ducks in the deep litter floor system were higher than for those in the cage system. Male ducks had heavier slaughter, hot carcass, cold carcass, head, foot, heart, liver, gizzard, and intestinal weights than female ducks. Slaughter, hot carcass, cold carcass, head, foot, heart, liver, gizzard, and intestinal weights were significantly affected by slaughter age. There were no significant differences between the slaughter ages of 10 weeks and 12 weeks in terms of slaughter weight, hot and cold carcass weight, and head weight. Feed conversion and survival rates are presented in the Figure. Feed conversion rate was affected by housing system and age. Survival rates were not significantly affected by housing system and age. The ducks showed a better feed conversion ratio in the tenth week, but after this week, poor feed conversion efficiency was observed based on slow live weight gain. Feed conversion ratios were better in the deep litter floor system than the cage system.

Table 1. Ingredient and chemical analysis of the concentrate fed during the starter and grower periods.

Ingredient	Starter (%)	Grower (%)
Corn	54.00	65.00
Soybean	40.15	29.15
Vegetable oil	3.00	3.00
Limestone	1.00	1.00
Dicalciumphosphate	1.00	1.00
Dl – Methionine	0.10	0.10
Salt	0.25	0.25
Vit.–Min. Premix[1]	0.50	0.50
Chemical analysis		
Dry matter (DM)	92.50	93.10
Crude protein	22.00	18.00
Metabolizable energy[2] (kcal/kg)	3015	3125
Ether extract (in DM)	3.75	3.35
Crude fiber (in DM)	3.70	4.40
Ash (in DM)	7.70	6.10

[1]Provided per kg concentrate: Vitamin A, 21,000 IU; Vitamin D_3, 4,200 IU; Vitamin E, 52.5 mg; Vitamin K_3, 4.38 mg; Vitamin B_1, 5.25 mg; Vitamin B_2, 12.25 mg; Vitamin B_6, 7 mg; Vitamin B_{12}, 0.03 mg; Folic acid, 1.75 mg; D-Biotin, 0.08 mg; Vitamin C, 87.5 mg; Niacin, 70 mg; Cal-D-Pantothenate, 14 mg; Choline chloride, 218.75 mg; Fe, 140 mg; Zn, 105 mg; Cu, 14 mg; Co, 0.35 mg; I, 1.75 mg; Se, 0.26 mg; Mn, 140 mg.
[2]Provided by calculation; reference (10).

Table 2. The effects of housing system, sex, and slaughter age on slaughter, hot carcass, cold carcass, head, foot, heart, liver, gizzard, and intestinal weight.

Traits			n	Slaughter weight (g)	Hot carcass weight (g)	Cold carcass weight (g)	Head weight (g)	Foot weight (g)	Heart weight (g)	Liver weight (g)	Gizzard weight (g)	Intestinal weight (g)
Housing system	Cage system		60	1841 ± 28.75	1243 ± 21.92	1226 ± 22.09	87.99 ± 1.26	45.31 ± 0.52	12.86 ± 0.26	39.59 ± 1.05	57.78 ± 0.84	66.95 ± 1.51
	Deep litter floor		60	2170 ± 42.11	1490 ± 30.43	1465 ± 30.38	96.53 ± 1.77	51.02 ± 1.11	13.81 ± 0.34	41.38 ± 1.19	68.92 ± 1.26	66.29 ± 1.12
Sex	Male		60	2089 ± 42.36	1418 ± 30.49	1397 ± 30.12	97.70 ± 1.55	51.18 ± 0.95	14.12 ± 0.29	42.92 ± 1.16	67.42 ± 1.33	68.37 ± 1.14
	Female		60	1921 ± 38.53	1314 ± 30.04	1293 ± 29.90	86.81 ± 1.38	45.15 ± 0.76	12.55 ± 0.29	38.05 ± 1.01	59.28 ± 1.01	64.87 ± 1.47
Slaughter age	8		40	1908 ± 54.57^{b}	1275 ± 39.91^{b}	1244 ± 38.55^{b}	89.49 ± 2.14^{b}	45.15 ± 1.12^{c}	12.59 ± 0.40^{b}	36.59 ± 0.94^{b}	60.25 ± 1.53^{b}	60.98 ± 1.31^{c}
	10		40	2000 ± 50.77^{ab}	1371 ± 35.50^{a}	1356 ± 38.31^{a}	91.78 ± 2.04^{ab}	47.94 ± 1.00^{b}	13.20 ± 0.31^{b}	39.17 ± 1.19^{b}	63.10 ± 1.42^{b}	66.45 ± 1.53^{b}
	12		40	2108 ± 43.74^{a}	1452 ± 33.31^{a}	1435 ± 33.01^{a}	95.51 ±1.71^{a}	51.40 ± 1.13^{a}	14.22 ± 0.38^{a}	45.70 ± 1.55^{a}	66.71 ± 1.64^{a}	72.42 ± 1.53^{a}
	Interactive effects											
Cage system	Male	8	10	1763 ± 52.70	1161 ± 35.89	1135 ± 30.92	90.17 ± 3.94	43.83 ± 1.03	13.10 ± 0.64	37.82 ± 2.15	58.15 ± 2.58	64.65 ± 3.88
		10	10	1926 ± 68.10	1327 ± 42.56	1314 ± 42.08	90.60 ± 2.80	46.62 ± 1.22	13.11 ± 0.55	42.51 ± 3.29	59.59 ± 1.59	65.20 ± 2.24
		12	10	2026 ± 70.27	1377 ± 49.68	1364 ± 47.75	96.38 ± 2.06	48.20 ± 1.34	14.61 ± 0.61	46.09 ± 3.18	62.80 ± 2.32	69.21 ± 3.70
	Female	8	10	1660 ± 50.26	1074 ± 38.17	1050 ± 35.50	80.43 ± 1.90	42.02 ± 1.24	11.17 ± 0.45	33.88 ± 1.38	54.00 ± 1.48	55.12 ± 1.09
		10	10	1774 ± 80.96	1223 ± 60.42	1214 ± 61.10	80.90 ± 2.15	44.97 ± 1.05	12.11 ± 0.58	37.05 ± 2.14	55.31 ± 1.22	72.66 ± 4.16
		12	10	1895 ± 37.37	1292 ± 35.10	1278 ± 39.67	89.46 ± 2.40	46.19 ± 1.00	13.08 ± 0.48	40.20 ± 1.20	56.83 ± 0.99	74.87 ± 3.23
Deep litter floor	Male	8	10	2227 ± 100.33	1501 ± 63.40	1467 ± 62.18	98.19 ± 4.36	53.20 ± 2.22	13.41 ± 0.74	40.31 ± 2.14	72.00 ± 2.40	66.54 ± 0.96
		10	10	2231 ± 105.35	1500 ± 79.56	1487 ± 79.75	105.30 ± 2.89	54.90 ± 1.40	14.40 ± 0.64	40.40 ± 2.02	74.20 ± 1.63	67.30 ± 0.86
		12	10	2364 ± 95.96	1641 ± 72.06	1618 ± 71.30	105.60 ± 3.81	60.30 ± 1.85	16.10 ± 0.77	50.40 ± 2.62	77.80 ± 1.87	77.30 ± 1.90
	Female	8	10	1981 ± 123.45	1364 ± 91.66	1323 ± 89.36	89.20 ± 4.83	41.56 ± 2.03	12.67 ± 1.11	34.35 ± 0.99	56.85 ± 2.12	57.62 ± 1.61
		10	10	2067 ± 98.58	1434 ± 71.73	1411 ± 71.36	90.30 ± 4.14	45.26 ± 2.34	13.20 ± 0.53	36.71 ± 1.56	63.29 ± 1.68	60.66 ± 3.06
		12	10	2149 ± 66.36	1498 ± 51.81	1481 ± 51.91	90.60 ± 2.86	50.90 ± 1.76	13.10 ± 0.75	46.10 ± 4.19	69.40 ± 2.34	68.30 ± 2.53
Housing system				***	***	***	***	***	**	NS	***	NS
Sex				***	**	**	***	***	***	***	***	*
Slaughter age				**	***	***	*	***	**	***	***	***
Housing system × Sex				NS	NS	NS	NS	***	NS	NS	**	**
Housing system × Slaughter age				NS	NS	NS	NS	NS	NS	NS	NS	NS
Slaughter age × Sex				NS	NS	NS	NS	NS	NS	NS	NS	*
Housing system × Slaughter age × Sex				NS	NS	NS	NS	NS	NS	NS	NS	NS

NS = not significant at P > 0.05, * = P < 0.05, ** = P < 0.01, *** = P < 0.001. Superscripts a, b, and c indicate significant differences between groups.

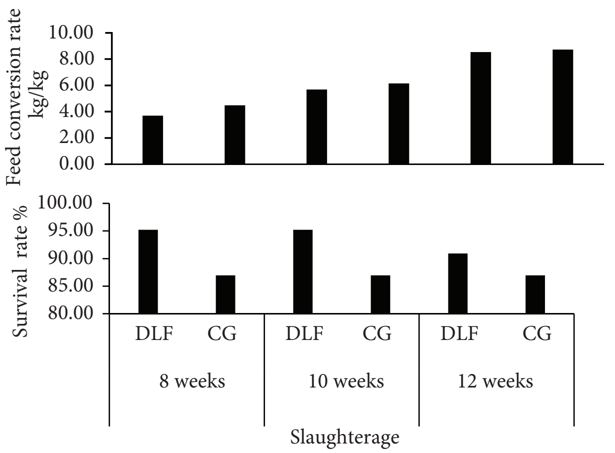

Figure. The effect of slaughter age and housing system on feed conversion and survival rates. DLF = deep litter floor, CG = cage system.

The main and interactive effects of different housing systems, sex, and slaughter age on hot and cold carcass, leg, breast, wing, neck, and back percentages of native Turkish ducks are shown in Table 3. Housing system significantly affected the hot and cold carcass, breast, wing, neck, and back percentages ($P < 0.05$, $P < 0.01$, and $P < 0.001$). The mean hot and cold carcass, breast, and neck percentages of ducks in the deep litter floor system were higher than for those in the cage system. Sex significantly affected the leg percentage ($P < 0.01$). Hot and cold carcass, leg, breast, and wing percentages were significantly affected by slaughtered age ($P < 0.001$). There were no significant differences between slaughter ages of 10 and 12 weeks in terms of hot and cold carcass, leg, breast, wing, neck, and back percentages. There were no interactions between slaughter age and sex, or between housing system, slaughter age, and sex (Table 3).

4. Discussion

In the current study, the values for feed conversion efficiency of ducks at 8 and 10 weeks in the deep litter floor system were 3.70 and 5.68 kg, respectively. These results were in agreement with the reports by Alpay (14) for Pekin ducks at 7 and 9 weeks of age. There is no other information about feed conversion efficiency in native Turkish ducks at 8 and 10 weeks of age. The feed conversion efficiency at the eighth week and in the range of 0–8 weeks in the cage system were 6.84 and 4.48 kg, respectively. These results were in agreement with the reports by Arslan et al. (15) for native Turkish ducks raised on a fattening platform. Feed conversion ratio was better in the deep litter floor system than in the cage system. This result could be explained by the fact that feeding, lying, walking, and object pecking activities were better in the deep litter floor system than in the cage system (16). Stress is much higher in the cage system (17).

The slaughter weights of ducks in the deep litter floor system were significantly higher than for those in the cage system. In the present study, the slaughter weights for males and females (1763 and 1660 g, respectively) at 8 weeks of age in the cage system were similar to those given by Arslan et al. (15), who reported slaughter weights of carnitine-fed and control groups (1750 and 1653 g, respectively) at 8 weeks of age in native Turkish ducks raised on a fattening platform. Slaughter weights observed in the present study were, however, lower than those reported by Sarı et al. (18) in native Turkish ducks. The slaughter weights of male and female ducks in the deep litter floor system at the age of 8 weeks were higher than those reported by Isguzar et al. (19) for black, mallard, gray, and Turkish Pekin male and female ducks. These differences might be due to differences in feeding method, fattening duration, origin, and slaughter age.

The values for hot carcass weight of ducks in the deep litter floor and cage systems were 1490 and 1243 g, respectively. The hot carcass weights in the present study are lower than those given by Arslan et al. (15), who reported carcass weights of 1653 and 1750 g for native Turkish ducks raised on a fattening platform. These differences might be due to differences in genetics, care, feeding methods, and slaughter weights. The average hot carcass weight for male and female ducks was 1418 and 1314 g, respectively. The hot carcass weights in the present study were lower than those given by Sarı et al. (18), reporting hot carcass weights of 1623 and 1489 g for native Turkish ducks reared in breeder conditions. These differences might be due to differences in feeding method, fattening duration, slaughter weight, and slaughter age. In the present study, cold carcass weights were higher in the deep litter floor system. Cold carcass weight in the deep litter floor system was 1465 g, while in the cage system it was 1226 g. In the current study, slaughter age affected the cold carcass weight, which was the highest at 12 weeks of age. However, slaughter age of between 10 and 12 weeks had no effect on cold carcass weight. Hot and cold carcass weights of ducks in the deep litter floor system for both sexes at 8 weeks of age in the present study were higher than those reported by Isguzar (20) for mixed local and Pekin ducks in intensive conditions at 7 weeks of age.

Housing system, sex, and slaughter age significantly affected the head, foot, heart, and gizzard weights ($P < 0.05$ and $P < 0.001$). The determined means of head, foot, heart, and liver weights were higher than those reported by Isguzar (20) for mixed local and Pekin ducks in intensive conditions at 7 weeks of age, but gizzard and intestinal weights were lower than those reported by Isguzar (20).

The mean hot carcass and cold carcass percentages of ducks in the deep litter floor system were higher than for those in the cage system. In the present study, the hot

Table 3. The effects of housing system, sex, and slaughter age on hot carcass, cold carcass, leg, breast, wing, neck, and back percentages.

Traits			n	Hotcarcass percentage (%)	Cold carcass percentage (%)	Leg percentage (%)	Breast percentage (%)	Wing percentage (%)	Neck percentage (%)	Back percentage (%)
Housing system	Cage system		60	67.44 ± 0.41	66.52 ± 0.43	21.38 ± 0.33	21.52 ± 0.78	16.02 ± 0.54	13.66 ± 0.17	27.42 ± 0.34
	Deep litter floor		60	68.58 ± 0.25	67.43 ± 0.26	21.14 ± 0.15	25.53 ± 0.28	13.62 ± 0.16	14.15 ± 0.13	25.48 ± 0.20
Sex	Male		60	67.82 ± 0.35	66.88 ± 0.35	20.86 ± 0.26	23.89 ± 0.58	14.66 ± 0.36	14.08 ± 0.17	26.47 ± 0.31
	Female		60	68.20 ± 0.35	67.08 ± 0.37	21.66 ± 0.25	23.16± 0.69	14.99 ± 0.48	13.73 ± 0.13	26.43 ± 0.31
Slaughter age	8		40	66.68 ± 0.45[b]	65.12 ± 0.41[b]	22.88 ± 0.31[a]	19.77 ± 0.86[b]	16.95 ± 0.63[a]	14.01 ± 0.21	26.37 ± 0.27
	10		40	68.56 ± 0.35[a]	67.81 ± 0.35[a]	20.65 ± 0.21[b]	25.48 ± 0.41[a]	13.43 ± 0.26[b]	13.94 ± 0.19	26.44 ± 0.34
	12		40	68.80 ± 0.39[a]	68.00 ± 0.40[a]	20.26 ± 0.25[b]	25.32 ± 0.64[a]	14.09 ± 0.42[b]	13.77 ± 0.16	26.54 ± 0.32
Interactive effects										
Cage system	Male	**8**	10	65.96 ± 1.21	64.53 ± 1.15	23.31 ± 0.77	17.54 ± 2.09	19.46 ± 0.80	13.70 ± 0.61	25.99 ± 0.97
		10	10	68.98 ± 0.62	68.29 ± 0.59	19.74 ± 0.45	25.23 ± 0.36	12.55 ± 0.21	14.42 ± 0.39	28.07 ± 0.85
		12	10	68.08 ± 1.16	67.45 ± 1.16	19.35 ± 0.61	24.71 ± 1.49	14.21 ± 0.76	13.63 ± 0.29	28.11 ± 0.75
	Female	**8**	10	64.65 ± 0.78	63.23 ± 0.63	24.62 ± 0.43	14.04 ± 0.37	21.25 ± 0.86	13.79 ± 0.35	26.30 ± 0.44
		10	10	68.85 ± 0.62	68.30 ± 0.71	20.82 ± 0.57	24.73 ± 1.42	13.47 ± 0.77	13.15 ± 0.43	27.87 ± 0.96
		12	10	68.13 ± 0.80	67.33 ± 0.92	20.48 ± 0.45	22.85 ± 1.75	15.23 ± 1.39	13.29 ± 0.28	28.17 ± 0.88
Deep litter floor	Male	**8**	10	67.49 ± 0.31	66.16 ± 0.36	21.16 ± 0.34	24.37 ± 0.62	13.51 ± 0.39	14.43 ± 0.43	26.47 ± 0.60
		10	10	67.06 ± 0.66	66.45 ± 0.66	20.76 ± 0.20	25.58 ± 0.49	14.37 ± 0.52	14.22 ± 0.38	24.93 ± 0.29
		12	10	69.35 ± 0.32	68.37 ± 0.33	20.86 ± 0.47	25.94 ± 0.58	13.85 ± 0.48	14.09 ± 0.30	25.25 ± 0.29
	Female	**8**	10	68.62 ± 0.57	66.56 ± 0.54	22.45 ± 0.23	23.14 ± 0.51	13.58 ± 0.26	14.11 ± 0.21	26.72 ± 0.60
		10	10	69.33 ± 0.78	68.18 ± 0.78	21.27 ± 0.16	26.39 ± 0.60	13.37 ± 0.31	13.98 ± 0.21	24.87 ± 0.42
		12	10	69.62 ± 0.52	68.87 ± 0.60	20.35 ± 0.40	27.79 ± 0.25	13.07 ± 0.16	14.09 ± 0.35	24.63 ± 0.24
Housing system				**	*	NS	***	***	*	***
Sex				NS	NS	**	NS	NS	NS	NS
Slaughter age				***	***	***	***	***	NS	NS
Housing system × Sex				NS	NS	NS	*	*	NS	NS
Housing system × Slaughter age				**	**	***	***	***	NS	NS
Slaughter age × Sex				NS	NS	NS	NS	NS	NS	NS
Housing system × Slaughter age × Sex				NS	NS	NS	NS	NS	NS	NS

NS = not significant at P > 0.05, * = P < 0.05, ** = P < 0.01, *** = P < 0.001. Superscripts a, b, and c indicate significant differences between groups.

carcass percentages for males and females (65.96% and 64.65%, respectively) at 8 weeks of age in cage systems were similar to those given by Arslan et al. (15), who reported hot carcass percentages of control and carnitine-fed groups (63.60% and 65.90%, respectively) at 8 weeks of age in native Turkish ducks raised on a fattening platform. Moreover, in the present study the hot carcass percentages in the cage system (68.98%) and deep litter floor system (67.06%) at 10 weeks of age for male ducks were found to be similar to those reported by Laçin and Aras (7), who showed hot carcass percentages at 10 weeks of age for male Pekin ducks in duck–fish integration groups (69.90%), in nonintegrated groups with ducks raised only in ponds without fish (68.90%), and in poultry house conditions (69.10%) with ducks raised without fish or ponds.

In the current study, the cold carcass percentage (65.12%) at 8 weeks of age was lower than that given by Erisir et al. (8), reporting a cold carcass percentage (70.60%) for Pekin ducks at 8 weeks of age; this value was also lower than that reported by Isguzar (20) for mixed local and Pekin ducks at 7 weeks of age. The effect of sex was not significant ($P > 0.05$) on hot and cold carcass percentages. This result was similar to that reported by Sarı et al. (18) for male and female native Turkish ducks and also reported by Omojola (21) for male and female Rouen, Pekin, and Muscovy ducks. However, hot and cold carcass percentages in the current study were higher than those reported by Sarı et al. (18). These differences might be due to differences in feeding method, fattening duration, slaughter weight, and slaughter age. Slaughter age affected the hot and cold carcass percentage, which was the highest at 12 weeks of age. However, slaughter age of between 10 and 12 weeks had no effect on hot carcass and cold carcass percentage. The hot carcass percentage at 12 weeks of age in our study was lower than that reported that by Isguzar et al. (19) at 12 weeks of age, but the hot carcass percentage at 8 weeks of age in our study was similar to that reported by Witak (22) at 8 weeks of age.

The leg and breast percentages in the present study were lower than those reported by Sarı et al. (18) in native Turkish male and female ducks, but wing, neck and back percentages were higher than those reported by Sarı et al. (18). The breast percentage at 8 weeks of age in our study was lower than that reported that by Erisir et al. (8) at 8 weeks of age for Pekin ducks, but the leg and wing percentages at 8 weeks of age in our study were higher than those reported by Erisir et al. (8). These differences may be explained by differences in feeding method and the use of different breeds of ducks.

In conclusion, results obtained from the present study showed that the deep litter floor system gave higher slaughter and carcass traits and feed conversion efficiency than the cage system for native Turkish ducks. The slaughter and carcass traits were higher in males than in females except for the hot carcass, cold carcass, and leg percentages. The ideal slaughter weight for native Turkish ducks was reached at 8 weeks, whereas the values for hot carcass weight, cold carcass weight, hot carcass percentage, and cold carcass percentage were better at 10 weeks of age. Therefore, it seems most appropriate to slaughter native Turkish ducks at 10 weeks of age. It is recommended that native Turkish ducks in the studied population be slaughtered at 10 weeks of age in order to have better slaughter and carcass traits. In terms of feed conversion rate, having the market age of native Turkish ducks be 10 weeks is more beneficial due to lower feed intake and lower feed cost.

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