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Comparison of Fattening Performance and Carcass Traits Measurements of Akkaraman and Awassi Male Lambs

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ABSTRACT

This research was carried out to compare fattening performance of Akkaraman and Awassi sheep. In this research, a total of 16 lambs were used, and each genotype group consisted of 8 male lambs about 3 months of age of which beginning live weight averaged was 20 kg. Lambs were fed up with ad libitum concentrated feed and given 150 g alfalfa to each animal for a fattening period of 70 days. Feed conversion ratios were found as follows; 4.93, 4.61 and total feed intakes were; 106.8 and 89.9 kg for Akkaraman and Awassi lambs respectively. Daily live weight gains were 314 and 284 g respectively. Cutting weight, cold carcass weight and carcass yield for Akkaraman were found as 43.28 kg, 21.35 kg and 49.29% respectively. These values were found as 39.66, 18.90 kg and 47.62% for Awassi respectively

1. Introduction

Lamb production has an important place in Turkey because of the sheep population, which is approximately 33 million, and traditional consumption behaviors of the people (TÜİK 2017). Nearly 87% of the sheep population in Turkey consists of fat-tailed sheep breeds. About 10-15% of the carcass in domestic breeds consists of tail fat. Red meat production in Turkey is approximately 1,130 thousand tons. About 100 thousand tons of this amount is produced from sheep. Mutton production constitutes 8.9% of total red meat production in Turkey (TÜİK 2017). Akkaraman and Awassi are the most important fat-tailed native sheep breeds of Turkey. Akkaraman in terms of number and breeding the most important breeds in Turkey. Akkaraman is bred both pure and also crossbreed with different breeds. The tail of this breed is fat and fattening performance is better than other native breeds. The Awassi is an indigenous breed, which usually takes attention with milk yield, reared in the southern provinces. Although it is known with milk yield the fattening performance of male lambs is noteworthy in the literature. The purpose of this study was to compare the fattening performances and body measurement of fat-tailed domestic sheep breeds Akkaraman and Awassi male lambs.

2. Material and Methods

This study was carried out Akkaraman (AK) and Awassi (AW) male lambs reared in the Research and Application Farm of Department of Animal Science, Agricultural Faculty, Selcuk University. In the research, about 3 month-old 8 male lambs from each breed, which has approximately 20 kg live weight, were employed. During the research, about 150 g dehydrated alfalfa was given to each animal per day. Concentrate feed and water were provided as *ad-libitum*. Feeding diet used throughout the study contains 2750 kcal/kg metabolic energy, 17% crude protein. During the research, the lambs were kept in individual pens in open shelter conditions. After 10 days of adaptation period, fattening period of lambs were started. The fattening period was finished at the end of 10 weeks. Live weight of lambs was weighed weekly while feed consumption and body measurements of lambs were measured at twice week in the early morning after a night of hunger as reported by Ertuğrul (1996).

During the study, water pail in every cage was cleaned in the morning and evening twice a daily. At the end of the ten weeks' period, the lambs were slaughtered. In the slaughtered lambs, the weights for the hot carcass, heart, liver, head, four feet, skin, internal fat, testis, kidney, spleen, and pelvis fat had identified. The carcasses were stored in cold storage at +^{o}C for 24 hours and, the cold carcass weights were determined. Dimensions of cold carcass were taken in accordance with the declaration of Ertuğrul (1985). Carcasses were shredded according to the standard carcass fragmentation method described by Colomer-Rocher et al. (1987), therefore, the weight of the carcass parts was determined in 1 g sensitive. In addition, eye muscle areas were measured with a Winfolia area meter scanner between ribs 12 and 13 (Ipek et al. 2014). The

samples were taken from the 6-12 ribs of the left half carcass, and, the amounts and ratios of fat, muscle, bone, inter-muscle fat and worthless parts were calculated from these samples. Also, pH and hardness values on the sample were determined. The color values were obtained from the eye muscle area, subcutaneous fat on eye-muscle and its inward and outward surfaces. Hue (H^o) and Chroma (C) values were calculated by using the following formulas. Hue = Tan-1 x (b*/a*) and Chroma = $\sqrt{a*2+b*2}$. In this study, Minitab 16 package program was used in the statistical analysis of data (Kocabaş et al. 2013).

3. Results and Discussion

In this study, Withers height, Rump height, Leg girth, Body length, Chest girth, Chest depth, Chest width, and Shin girth were measured and body development was followed. Determining of the body measurements are important in defining breed characteristics and it is also important of the course of fattening activity and in determining some carcass characteristics. The body measurements of lambs during the fattening period are given in Table 1. According to these results, the total body length gains were significantly affected by the groups (P<0.05).

At the beginning of fattening, the averages withers height of lambs was measured as 58.38 and 57.13 cm for Akkaraman and Awassi lambs, respectively. The total increase and percentage increase in the withers height were found to be 10.13 cm and 17.4%; 9.75 cm and 17.1% in Akkaraman and Awassi lambs, respectively. At the beginning of fattening, the averages of the lambs' rump heights were measured as 59.38 and 58.13 cm in Akkaraman and Awassi sheep lambs, respectively. Total and percentage increases in rump heights for Akkaraman and Awassi were 9.75 cm, 16.4%, 9.38 cm, 16.2%, respectively. The total and percentage increases of the leg girth in the Akkaraman lambs were 58.63 cm, 8.50 cm, and 14.5%, respectively. But in the Awassi lambs were found as 57.88 cm, 7.75 cm, and 13.3%, respectively. Body length measurements; were 52.06 cm in the Akkaraman and 50.38 cm in the Awassi (P <0.05). The total and percentage increases in Akkaraman were 6.06 cm and 11.7%, whereas in the Awassi were 7.75 cm, and 15.4%, respectively. The difference between the increases was statistically significant (P<0.05).

The chest girth averages in the Akkaraman lambs were 66.50 cm, 12.50 cm, and 18.8% respectively. Those values for Awassi were 64.88 cm, 11.25 cm, and 17.4%, respectively. The chest depth averages in the Akkaraman were 21.88 cm, 4.88 cm, and %22.5 respectively. In the Awassi, those values were 21.13 cm, 4.50 cm, and %21.4, respectively. The chest width averages in the Akkaraman were 13.75 cm, 5.25 cm, and %38.6, respectively. In the Awassi, those values were 13.13 cm, 4.75 cm, and %36.4, respectively. The shin girth in the initial fattening of Akkaraman was 7.31 cm, the total increase was 0.50 cm and the rate of increase was 7.1% but, while in the Awassi, those values were 7.44 cm, 0.56 cm, and 7.8%, respectively.

Aytekin et al. (2015) reported at the end of the 88-day fattening period that Akkaraman lambs' Withers height increased by 11.29 cm and 19.54%, rump height by 11.1 cm and 19%, chest girth by 20.2 cm and 30.5%, chest depth by 5.1 cm and 24.1%, leg girth by 18.1 cm and 31.6%, and the body length increased by 9.9 cm and 21%. The reported values are lower than the values in the study. The increase in the Withers height reported in the study of Aytekin et al (2015) is similar to the values of current study, but the other values in the increase of body measurements have been found higher than those in current study.

The obtained results on the fattening performance of Akkaraman and Awassi lambs are given in table 2. The initial fattening weight of the Akkaraman lambs was determined as 21.58, and the Awassi lambs were 20.06 kg. There was no statistically significant difference between the mean initial fattening weights of the groups. At the end of the fattening, the average weight of Akkaramans and Awassi lambs was 43.28 and 39.66 kg, respectively. The difference between the groups was statistically significant (P<0.05). Total weight gain was found as 21.70 and 19.60 kg, respectively. The difference between the total weight gain of the groups was statistically significant (P <0.05). Live weight gains during the fattening period in Akkaraman and Awassi lambs was 314 and 284 g, respectively (P <0.05). The average feed consumption of the groups was 106.8 and 89.9 kg in Akkaraman and Awassi lambs (P <0.01). The feed conversion ratio was calculated as 4.93 and 4.61 in Akkaraman and Awassi.

Daily live weight gain of Akkaraman lambs was higher than the values determined by Akçapınar (1991), Pembeci et al. (1991), Tekin et al. (1993), Dağ et al. (2000), Esen & Yildiz (2000), Sahin and Akmaz (2002), Unal et al. (2006), Karabacak & Boztepe (2007 and 2008), Aytekin et al. (2015) and, similar to the values reported by Karabacak et al. (2015). The feed conversion ratio in the current study was similar to the reported values by Ünal et al. (2006) (4.92), but lower than the reported values by Akçapinar et al. (1991), Tekin et al. (1993), Esen & Yildiz (2000), Sahin & Akmaz (2002) and Aytekin et al. (2015). Daily live weight gain of Awassi lambs was higher than the reported value for Awassi lambs by Macit et al. (2002), Kul & Akcan (2002) and Titi et al. (2008). The feed conversion ratio was lower than that was reported by Kul & Akcan (2002), Tekel et al. (2007) and Titi et al. (2008).

Table 1
Average body measurements of Akkaraman and Awassi lambs

Breed / Weeks		1	2	3	4	5	6	Total	Percent (%)
Withers height	AK	58.38±0.62	61.25±0.45	63.88±0.69	65.75±0.53*	66.88±0.44*	68.50±0.53	10.13±0.48	17.4±0.0092
	AW	57.13±0.55	60.00±0.73	62.13±0.64	63.88±0.52*	65.25±0.49*	66.88±0.67	9.75±0.75	17.1±0.014
Rump height	AK	59.38±0.53	61.75±0.56	64.00±0.68	66.13±0.55	67.00±0.38	69.13±0.48	9.75±0.25	16.4±0.0050
	AW	58.13±0.58	61.25±0.67	63.50±0.71	65.00±0.57	66.13±0.67	67.50±0.76	9.38±0.62	16.2±0.011
Leg girth	AK	58.63±0.65	60.13±0.67	62.38±0.80	64.38±0.73	65.75±0.65	67.13±0.67	8.50±0.53	14.5±0.0097
	AW	57.88±0.99	60.00±1.2	61.63±1.0	63.00±1.1	64.38±1.3	65.63±1.4	7.75±0.45	13.3±0.0061
Body length	AK	52.06±0.27*	52.50±0.27	54.25±0.25	55.56±0.22	57.13±0.30	58.13±0.40	6.06±0.54*	11.7±0.011*
	AW	50.38±0.53*	51.88±0.23	53.75±0.31	55.50±0.50	56.63±0.63	58.13±0.55	7.75±0.49*	15.4±0.010*
Chest girth	AK	66.50±0.50	71.50±0.73	73.75±0.65*	75.25±0.70	76.63±1.0	79.00±0.80*	12.50±0.53	18.8±0.0078
	AW	64.88±0.93	69.13±1.1	70.75±1.2*	73.00±1.1	74.63±1.0	76.13±0.85*	11.25±0.53	17.4±0.0093
Chest depth	AK	21.88±0.48	22.5±0.27	23.63±0.26	24.75±0.25	26.00±0.19	26.75±0.16*	4.88±0.30	22.5±0.018
	AW	21.13±0.30	22.25±0.25	23.25±0.25	24.31±0.25	25.25±0.37	25.63±0.38*	4.50±0.33	21.4±0.016
Chest width	AK	13.75±0.37	15.25±0.25	16.25±0.25	17.25±0.25	18.44±0.26*	19.00±0.38*	5.25±0.37	38.6±0.032
	AW	13.13±0.23	14.50±0.42	15.38±0.32	16.38±0.32	17.50±0.27*	17.88±0.23*	4.75±0.25	36.4±0.024
Shin girth	AK	7.31±0.16	7.25±0.16	7.38±0.18	7.56±0.11	7.69±0.13	7.81±0.13	0.50±0.16	7.1±0.023
	AW	7.44±0.18	7.50±0.19	7.50±0.19	7.69±0.16	7.88±0.21	8.00±0.16	0.56±0.15	7.8±0.020

*P<0.05, **P<0.01

Table 2.
Average Fattening Performance of Akkaraman and Awassi lamb

Breed / Weeks		Beginning	1	2	3	4	5
LW	AK	21.58±0.69	24.04±0.90	25.98±0.93	28.15±0.97	30.55±1.0	32.66±1.2
	AW	20.06±0.61	22.30±0.88	23.98±0.87	25.79±0.93	27.74±0.92	29.73±1.0
LWG	AK		2.46±0.33	1.94±0.13	2.17±0.16	2.40±0.24	2.11±0.24
	AW		2.24±0.31	1.68±0.20	1.81±0.11	1.95±0.13	1.99±0.14
DLWG	AK		352±0.047	277±0.018	310±0.023	343±0.035	301±0.035
	AW		320±0.045	240±0.028	259±0.016	278±0.018	285±0.020
FI	AK		9.82±0.35**	9.32±0.27**	9.47±0.47**	11.14±0.41*	10.57±0.61*
	AW		7.78±0.28**	7.30±0.40**	7.81±0.27**	9.44±0.41*	8.92±0.32*
FCR	AK		4.48±0.53	4.92±0.28	4.53±0.41	4.94±0.46	5.38±0.53
	AW		3.95±0.52	4.91±0.77	4.39±0.24	5.00±0.39	4.58±0.27
Breed / Weeks		**6**	**7**	**8**	**9**	**10**	**total**
LW	AK	34.62±1.1	36.91±1.1	39.48±1.2*	41.64±1.1*	43.28±1.2*	21.70±0.66*
	AW	31.69±1.0	33.66±1.1	35.93±1.1*	38.02±1.1*	39.66±1.2*	19.60±0.63*
LWG	AK	1.96±0.18	2.29±0.34	2.57±0.25	2.16±0.21	1.64±0.18	21.70±0.66*
	AW	1.96±0.16	1.97±0.23	2.28±0.18	2.09±0.15	1.64±0.27	19.60±0.63*
DLWG	AK	280±0.026	328±0.049	367±0.035	308±0.030	274±0.030	314±0.095*
	AW	280±0.023	281±0.032	325±0.026	298±0.021	274±0.046	284±0.093*
FI	AK	11.02±0.63*	10.73±0.49	11.91±0.36**	12.28±0.38**	10.54±0.24**	106.8±3.6**
	AW	9.23±0.24*	9.61±0.24	10.01±0.17**	10.47±0.29**	9.37±0.26**	89.9±2.2**
FCR	AK	6.02±0.78	7.63±3.3	5.00±0.61	6.20±0.76	7.13±0.98	4.93±0.14
	AW	4.94±0.40	5.17±0.39	4.64±0.44	5.24±0.51	6.86±1.1	4.61±0.13

*P<0.05, ** P<0.01

Some slaughter and carcass traits of Akkaraman and Awassi lambs are given in table 3. The differences between the mean slaughter weight, hot carcass weight, cold carcass weight, rump width, tail weight, tail ratio, tail length and tail width were statistically significant (P<0.05), and these values were determined as 43.28, 39.66 kg; 21.8,19.4 kg; 21.35, 18.9 kg; 19.9, 18.1 cm; 3.17, 2.31 kg; 14.83%, 11.93%; 24.6, 21.6 cm; 29.4, 25.9 cm, respectively. The differences between testis weight, chest depth and chest width of the groups were statistically significant (P <0.01), and these values were obtained as 210, 116 g; 27.1, 25.9 cm; 18.7, 17.5 cm, respectively. The average carcass yield (dressing percentage) of Akkaraman and Awassi lambs was 49.29% and 47.62%, respectively.

The differences between the mean fore ribs weight, the flank weight and the neck ratio were statistically significant (P<0.05), and these values were 3.20, 2.84 kg; 597, 487 g; 1.14, 1.02 kg; 6.5%, 7.9%, respectively. The differences between the average subcutaneous fat weight and the subcutaneous fat ratio obtained from the sample were statistically significant (P<0.01) and these values was 130, 82 g; 18.4%, 13.5%, respectively.

The slaughter, hot carcass and cold carcass weights of Akkaramans were lower than the values determined by Ünal et al. (2006), Tekin et al. (1993) and Aytekin et al. (2015) but these values were higher than those reported by Şahin & Akmaz (2002). Tail weight and tail ratio of Akkaraman were close to the reported values by Tekin et al. (1993), Esen & Stars (2000), Sahin

& Akmaz (2002), Unal et al. (2006) and Aytekin et al. (2015). In terms of tissue composition, the bone in the region of chop, intermuscular fat, subcutaneous fat, and worthless parts ratios were lower than the rates determined for Akkaraman by Karabacak & Boztepe (2008), Karabacak et al. (2015) and Aytekin et al. (2015), but, muscle ratio was higher than the above literature values. Slaughter and carcass weights for Awassi reported by Kul & Akcan (2002) were higher than the current study values. Slaughter and carcass weights for Awassi reported by Macit et al. (2002) were lower but carcass yield was higher than those in current study values. The head weight and leg depth in the same study were higher than those in current study values, and shoulder and neck ratios were close to the values in current study values. Carcass length, leg circumference, chest circumference, tail weight, and *M. Longissimus dorsi* area was lower than the values in current study values. Macit et al. (2003) reported the study values as hot carcass weight (19.9 kg), cold carcass weight (19 kg), and cold carcass yield (42.3%) and *M. Longissimus dorsi* area (13.3 cm^2) for Awassi lambs with 75 days feeding period. The carcass weight of Awassi in current study was close to the reported values by Macit et al. (2003), and the carcass yield and eye muscle area were higher than the reported values. The slaughter and carcass weight reported by Gül et al. (2005) for Awassi lambs with 95 days feeding period were higher but carcass yield was similar to those in current study values. The slaughter and carcass weight reported by Tekel et al. (2007) for Awassi lambs were lower than the values in current study values, and carcass yield and sheepskin weight were similar to current study values. The slaughter and carcass weight determined by Esenbuğa et al. (2009) in Awassi lambs were higher than those in current study values, the yield was similar to current study values, but *M. Longissimus dorsi* area was lower than the value in current study values.

Table 3.
Average of slaughter and carcass characteristics of Akkaraman and Awassi lambs

Traits	AK	AW	Traits	AK	AW
Slaughter weight. (kg)	43.28±1.2*	39.66±1.2*	**Chest width (cm)**	18.7±0.19**	17.5±0.28**
Warm carcass (kg)	21.80±0.56*	19.40±0.60*	**Chest girth (cm)**	75.2±0.74	73.5±0.76
Cold carcass (kg)	21.35±0.65*	18.90±0.69*	**Leg length (cm)**	39.9±0.48	39.4±0.46
Cooling loss (%)	2.16±0.71	2.68±1.0	**Leg width (cm)**	7.44±0.18	7.2±0.091
Dressing percentage (%)	49.29±0.34	47.62±0.86	**Leg depth (cm)**	10.3±0.27	10.0±0.43
Head (kg)	2.08±0.046	2.15±0.055	**Leg girth (cm)**	27.1±0.58	26.9±0.79
Skin (kg)	4.76±0.13	4.69±0.18	**Rump width (cm)**	19.9±0.54*	18.1±0.50*
Feet (g)	930±0.027	916±0.021	**Carcass length (cm)**	76.6±1.5	76.4±1.0
Heart+Lungs+Liver (kg)	1.63±0.050	1.52±0.048	**Tail weight (kg)**	3.17±0.17*	2.31±0.28*
Spleen (g)	67±0.0025	70±0.0039	**Tail ratio "(%)**	14.83±0.60*	11.93±1.2
Kidney (g)	128±0.004	127±0.004	**Tail length (cm)**	24.6±0.91*	21.6±0.67*
Testis (g)	210±0.016**	116±0.014**	**Tail width (cm)**	29.4±0.46*	25.9±1.2*
Kidney and pelvic fat (g)	284±0.023	220±0.024	**Tail girth (cm)**	62.6±1.3	57.1±3.0
Left half carcass (kg)	9.26±0.29	8.47±0.25	**Fat thickness over rib (mm)**	2.66±0.31	2.73±0.31
Leg (kg)	3.20±0.13*	2.84±0.06*	**Fat thickness over EY (mm)**	6.13±0.34	4.90±0.53
Back-Loin (kg)	2.13±0.090	1.92±0.099	**Eye muscle area (cm^2)**	16.86±1.1	16.69±1.3
Fore ribs (kg)	597±0.024*	487±0.034*	**Sample (g)**	733±0.045	647±0.034
Neck (kg)	595±0.05	672±0.04	**Lean meat (g)**	367±20	327±20
Shoulder (kg)	1.60±0.05	1.52±0.04	**Bone (g)**	143±9.6	136±11
Flank (kg)	1.14±0.04*	1.02±0.04*	**Subcutaneous fat (g)**	130±13**	82±6.4**
Leg (%)	34.6±0.72	33.7±0.59	**Inter muscular fat (g)**	45±5.5	48±6.3
Back-Loin (%)	23.0±0.53	22.6±0.59	**Worthless parts (g)**	17±2.3	22±2.4
Fore ribs (%)	6.5±0.23	5.7±0.31	**Lean meat (%)**	52.4±1.6	53.3±1.7
Neck (%)	6.4±0.44*	7.9±0.27*	**Bone ratio (%)**	20.3±0.73	22.0±1.1
Shoulder (%)	17.3±0.38	18.0±0.38	**Subcutaneous fat (%)**	18.4±1.1**	13.5±0.92**
Flank (%)	12.3±0.24	12.0±0.34	**Inter muscular fat (%)**	6.4±0.67	7.7±0.84
Chest depth (cm)	27.1±0.24**	25.9±0.31**	**Worthless parts (%)**	2.5±0.34	3.6±0.44

*P<0.05, **P<0.01

Color, pH and tenderness values of the meat give information about the quality and freshness of the carcass and carcass parts. Kind, breed, feeding, breeding system (breeding), pre- and post-slaughtering applications (transport, the number of animals in slaughtering departments, slaughtering waiting time, temperature, type of slaughtering, operations carcass undergo and storage conditions, etc.) are the affecting factors to the carcass quality (Boles & Pegg 1999; Diaz et al. 2002; Önenç & Kaya 2003; Karabacak et al. 2012). The color in the flesh is mainly caused by myoglobins, a muscle pigment. Myoglobin serves as an oxygen carrier in tissues (Boles & Pegg 1999; Kim et al. 2010). The amount of myoglobin in the muscle varies depending

on the growth, development, and activity of the muscles. The color of the meat changes according to the oxidation after slaughtering and the amount of glycogen in the muscles (Boles & Pegg 1999; Önenç & Kaya 2003). Similarly, the pH value of the meat varies depending on the rate of oxygenation, enzyme activity, and muscle glycogen content. In fresh meat after slaughtering, the pH level is around 7.0-7.5, and this value decreases to 5.4-5.8 in meat that is kept in cold weather (+4 C^0) for 24 hours. When the amount of muscle glycogen during the slaughtering is low, the pH of meat remains high as normal acidification does not occur and this makes the meat dark in color and leads to shortening shelf life (Boles & Pegg 1999; Önenç & Kaya 2003; Yaralı et al. 2014).

The pH, hardness and color values measured on the samples taken from carcasses of Akkaraman and Awassi lambs are given in table 4. The hardness measurement is made on the eye muscle, the pH measurement is made in the eye muscle area, and the color measurements are made on four different areas: the inner and outer surface of the sample, eye muscle area, and subcutaneous fat area. In the study, L*, a* and b* values of color parameters for the eye muscle region of Akkaraman male lambs were determined as 38.06, 16.45 and 3.03, respectively. H^0 and C values measured using these values were calculated as 10.20 and 16.74, respectively. The pH and stiffness values of the eye muscle area were determined as 5.39 and 289.9, respectively. In the same region, L*, a*, b*, H^0 and C values of Awassi were 39.47, 15.68, 4.10, 14.65 and 16.24, respectively. The pH and hardness values of the Awassi were measured as 5.37 and 286.2.

Karabacak et al. (2012) determined that L*, a*, b* and H^0 and C color values for *M. Longissimus dorsi* and pH and hardness values as 39.53, 15.46, 2.22, 7.99 and 15.65, respectively, and 5.61 and 415.54, respectively in approximately 2.5-3 month-old aged Malya breed male lambs feeding for 58 days in the free-stall barn conditions and sending them to slaughtering with 38 kg live weight. The reported H^0 value was lower than the value in current study values, the hardness value was higher than the in current study values, and the other findings were close to the findings in current study values. The same researchers (Karabacak et al. 2015a) reported that the L*, a*, b* and H^0 and C color values for *M. Longissimus dorsi* and pH and hardness values under open sheepfold conditions on the Anatolian merino male lambs feeding for 58 days under open and closed sheepfold conditions as 41.78, 15.33, 4.83, 17.57 and 16.11, 5.56 and 437.2, respectively, and 43.86, 13.81, 5.72, 22.34 and 14.97, 5.53, and 441.3, respectively. The reported a*, C and pH values were close to the findings in current study values and other findings were higher than the findings of current study values.

Table 4
Color, pH and hardness values of Akkaraman and Awassi lambs

		AK	AW
Hardness		289.9±15	286.2±14
pH	**pH**	5.39±0.009	5.37±0.013
	^{0}C	18.91±0.43	19.03±0.18
Outdoor	**L***	62.57±0.80	66.26±2.4
	a*	4.98±0.45	5.60±1.1
	b*	7.56±0.36	7.99±0.61
	H*	56.51±2.4	57.03±3.4
	C*	9.13±0.42	9.89±1.1
Indoor	**L***	70.36±1.3	73.13±2.5
	a*	2.65±0.39*	1.59±0.24*
	b*	3.07±0.56	3.22±0.72
	H*	47.8±6.3	51.5±10
	C*	4.22±0.52	3.76±0.64
Over of eye muscle area	**L***	56.32±1.3	53.46±2.3
	a*	5.58±0.54	6.28±1.4
	b*	-3.06±0.44	-2.96±0.63
	H*	-29.7±5.4	-32.7±8.0
	C*	6.56±0.36	7.43±1.1
Eye muscle area	**L***	38.06±1.1	39.47±1.1
	a*	16.45±0.81	15.68±0.40
	b*	3.03±0.39	4.10±0.40
	H*	10.20±0.91*	14.65±1.4*
	C*	16.74±0.86	16.24±0.41

*P<0.05

Also, Karabacak et al. (2015b) reported that the L*, a*, b* and H^0 and C color values for *M. Longissimus dorsi* and pH and hardness values under open sheepfold conditions of the Akkaraman male lambs with 20 kg live weight and feeding for 58 days as 42.78, 13.29, 4.69, 19.52, 14.12, and 5.53 and 453.8 respectively, and 43.93, 13.85, 4.77, 18.94, 14.66, and 5.56 and 446.9 respectively under closed sheepfold sheepfold conditions. The mentioned findings of L*, b*, H^0 and hardness values were higher than the findings the obtained current study values, a* and C values were lower than the values in current study values and the pH value was similar. The color and pH values of *M. Longissimus dorsi* stated by Aytekin et al. (2015) for Akkaraman lambs, feeding for 88 days, were similar to the findings of current study values, but hardness values were found as higher. L* and b* values reported by Macit et al. (2003) in Awassi lambs were higher than those in current study values but a* values were lower. H^0 values reported by Gül et al. (2005) for the Awassi lambs were close to the values in current study values and L*, a* and b* and C values were higher than the findings of current study. L*, a*, b* H^0 and C values reported by Esenbuga et al. (2009) in the Awassi lambs, H^0 value was similar to the findings of current study value but the other values were higher than the findings of current study.

4. Conclusion

When the Akkaraman and Awassi lambs are subjected to the same feeding regime under the same environmental conditions, it was seen that the Akkaraman breeds have more live weight gain. Feed intake was lower in Awassi. The amount of feed consumed per kg live weight gain is low in the Awassi breeds. Live weight gain was found to be statistically significant in Akkaraman breeds ($P<0.05$). Feed intake in Awassi breeds was found to be statistically significant ($P<0.01$). The difference between feed conversion ratios was found to be insignificant ($P> 0.05$). Depending on the difference in the slaughter weight, some carcass parts were also heavier in Akaraman. The tail weight and accordingly the tail rate were higher in the Akkaraman. According to the obtained data from the sample, the rate of subcutaneous fat was higher in Akkaraman.

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