

## SLAUGHTER AND CARCASS CHARACTERISTICS OF TUSHIN AND RED KARAMAN LAMBS RAISED IN SEMI INTENSIVE CONDITIONS

Turgut KIRMIZIBAYRAK\* Mustafa SAATCI\* Ali Rıza AKSOY\*

Geliş Tarihi : 31.03.2003

**Summary:** This study was carried out to investigate the slaughter and carcass characteristics of Tushin and Red Karaman male and female lambs reared in semi-intensive conditions which is similar to local lamb breeding practice in Kars region. Totally 20 lambs at age of 6 months belonging to two different breed and sex groups were used. All carcasses were divided into five cuts namely; leg, shoulder, loin, back and remainders.

Slaughter weight, cold carcass weight, dressing percentage (cold), leg weight, shoulder weight, back weight, loin weight, remainder weight, fat tail weight, eye-muscle area and skin weight were found to be 41.36kg, 18.53kg, 44.80%, 5.66kg, 2.95kg, 1.30kg, 1.31kg, 3.83kg, 2.85kg, 9.84cm<sup>2</sup> and 4.06kg for Tushin male lambs; 32.72kg, 14.95kg, 45.69%, 4.63kg, 2.42kg, 1.17kg, 1.27kg, 2.90kg, 1.94kg, 8.90cm<sup>2</sup> and 3.77kg for Tushin female lambs; 42.48kg, 18.58kg, 43.74%, 6.04kg, 3.26kg, 1.36kg, 1.55kg, 3.74kg, 2.10kg, 10.46cm<sup>2</sup> and 3.95kg for Red Karaman male lambs; 37.80kg, 16.29kg, 43.10%, 5.36kg, 2.72kg, 1.23kg, 1.32kg, 3.45kg, 1.52kg, 10.00cm<sup>2</sup> and 4.07kg for Red Karaman female lambs respectively. On the basis of investigated characteristics of lambs belonging to two different breeds in the same sex groups showed similar and low performance. Because of the short pasture season, generally low slaughter and carcass performances were observed.

**Key Words:** Tushin, Red Karaman, Lamb, Slaughter and Carcass Characteristics

### Yarı-Entansif Şartlarda Yetiştirilen Tuj ve Morkaraman Kuzuların Kesim ve Karkas Özellikleri

**Özet:** Bu araştırma, Kars yöresindeki kuzu yetiştiricilerinin şartlarına benzer olarak, yarı-entansif koşullarda yetiştirilen Tuj ve Morkaraman ırkı erkek ve dişi kuzuların kesim ve karkas özelliklerini belirlemek amacıyla yapılmıştır. Araştırmanın hayvan materyalini her cinsiyetten 5'er baş olmak üzere, toplam 20 baş 6 aylık yaştaki erkek ve dişi kuzular oluşturmuştur. Karkaslar but, kol, sırt, bel ve diğerleri olmak üzere 5 parçaya ayrılmıştır.

Araştırmada kuzuların kesim öncesi canlı ağırlığı, soğuk karkas ağırlığı, soğuk karkas randımanı, but ağırlığı, kol ağırlığı, sırt ağırlığı, bel ağırlığı, diğerleri ağırlığı, kuyruk yağı ağırlığı, MLD kesit alanı ve deri ağırlığı ortalamaları Tuj ırkı erkek kuzularda sırasıyla 41.36kg, 18.53kg, %44.80, 5.66kg, 2.95kg, 1.30kg, 1.31kg, 3.83kg, 2.85kg, 9.84cm<sup>2</sup> ve 4.06kg; Tuj dişi kuzularda 32.72kg, 14.95kg, %45.69, 4.63kg, 2.42kg, 1.17kg, 1.27kg, 2.90kg, 1.94kg, 8.90cm<sup>2</sup> ve 3.77kg; Morkaraman ırkı erkek kuzularda 42.48kg, 18.58kg, %43.74, 6.04kg, 3.26kg, 1.36kg, 1.55kg, 3.74kg, 2.10kg, 10.46cm<sup>2</sup> ve 3.95kg; Morkaraman dişi kuzularda 37.80kg, 16.29kg, %43.10, 5.36kg, 2.72kg, 1.23kg, 1.32kg, 3.45kg, 1.52kg, 10.00cm<sup>2</sup> ve 4.07kg olarak saptanmıştır. Bu araştırmada incelenen özellikler bakımından, aynı cinsiyet için her iki ırkın birbirine benzer ancak düşük düzeyde performans gösterdiği belirlenmiştir. Yörede mera sezonunun kısa olması nedeniyle, incelenen kesim ve karkas özellikleri düşük düzeyde belirlenmiştir.

**Anahtar Sözcükler:** Tuj, Morkaraman, Kuzu, Kesim ve Karkas Özellikleri.

### INTRODUCTION

Sheep population in Turkey is approximately 29.5 million that is consisted of native breeds and their crossbreds<sup>1</sup>. Red Karaman is among the native sheep breeds and has the second largest sheep population in Turkey. Tushin is another native sheep breed, which is merely bred in Kars, Ardahan and Iğdir provinces in Turkey<sup>2</sup>. Tushin sheep is also bred in Caucasian region, particularly in Georgia.

Extensive breeding is a common sheep breeding method in north east of Turkey. Geographical structures of the east of Turkey do not show optimal conditions for agricultural practices, therefore sheep breeding is the most important practice in the region. In order to reduce costs of winter-feeding, breeders tend to sell increasing number of male and female lambs at the end of the pasture season.

Previous fattening studies on male lambs showed that slaughter weight, cold carcass weight, cold carcass dressing percentage, leg weight, shoulder weight, loin weight, back weight, the remainders weight, tail weight, eye-muscle area and skin weight values were as follows: 34.7-42.8kg, 13.2-20.7kg, 40.0-49.6%, 3.7-5.4kg, 2.3-3.1kg, 1.1-1.4kg, 0.86-1.88kg, 3.7-5.0kg, 1.4-4.0kg, 13.2-14.4cm<sup>2</sup> and 3.7-5.4kg respectively for Tushin breed<sup>3-6</sup>; 32.0-44.8kg, 12.1-21.9kg, 39.5-49.5%, 3.9-5.4kg, 2.1-3.1kg, 0.76-1.2kg, 0.68-1.3kg, 3.4-5.4kg, 1.2-4.1kg, 12.3-13.6cm<sup>2</sup> and 3.8-4.5kg respectively for Red Karaman breed<sup>4-7</sup> and 51.3kg, 24.6kg, 47.9%, 7.2kg, 4.4kg, 2.2kg, 2.0kg, 6.9kg, 0.5kg, 12.3cm<sup>2</sup> and 7.3kg respectively for Karayaka breed<sup>8</sup>. Same characteristics in crossbred male lambs of some meat breeds and fat tailed native breeds were found 44.7kg, 21.7kg, 48.5%, 7.8kg, 3.9kg, 2.0kg, 1.8kg, 5.5kg, 0.61kg, 13.1cm<sup>2</sup> and 6.1kg respectively for German

\* Kafkas University, Veterinary Faculty, Dept. of Animal Science, Kars-TURKEY

Black-headed Mutton (GBM) x Awassi (A) (F1)<sup>9</sup>; 45.6kg, 21.9kg, 48.0%, 7.2kg, 3.9kg, 1.9kg, 1.8kg, 5.7kg, 0.68kg, 14.0cm<sup>2</sup> and 6.5kg respectively for GBM x White Karaman (WK) (F1)<sup>10</sup>; 45.2kg, 23.0kg, 51.0%, 7.7kg, 4.1kg, 2.1kg, 1.9kg, 6.0kg, 0.69kg, 14.8cm<sup>2</sup> and 5.6kg respectively for Hampshire Down (HD) x A (F1)<sup>9</sup>; 44.8kg, 22.3kg, 49.7%, 7.3kg, 4.0kg, 2.0kg, 1.8kg, 5.6kg, 0.86kg, 14.8cm<sup>2</sup> and 6.2kg respectively for HD x WK (F1)<sup>10</sup>. Also some fattening studies reported that cold carcass weight of Karakas male lambs<sup>11,12</sup> was 16.5-22.2kg, additionally cold carcass weight and eye-muscle area values for White Karaman<sup>13,14</sup> were 19.6-20.2kg and 11.7cm<sup>2</sup> respectively.

This study was carried out to investigate the slaughter and carcass characteristics of Tushin and Red Karaman male and female lambs reared in semi-intensive conditions, which is similar to regional breeding practice.

## MATERIALS and METHODS

This study was carried out in Research Farm of Kafkas University. Animal materials were constituted of male and female lambs of Tushin and Red Karaman sheep breeds. All lambs were kept with their mothers until 90<sup>th</sup> day of age (weaning age) and later kept as a flock with other lambs separated from their mothers and were reared in semi-intensive conditions

until 6 months of age. Lambs were grazed on pasture and were also fed daily to 150g-concentrated feed, which contained 16% crude protein and 2500kcal/kg metabolic energy as a lamb growing supportive feeding. A total of 20 lambs were divided into four groups for slaughtering and 5 male and 5 female lambs were slaughtered from each genotype.

Lambs were not allowed to eat for 12 hours until slaughtering. Slaughtering weights were recorded just before the slaughter. Weights of carcass, skin, head, feet, liver, lung, heart, spleen, testicles, small intestines, and 4 stomachs were also recorded after slaughter. All carcasses were divided into five cuts namely; leg, shoulder, loin, back and remainders<sup>15</sup>.

For the analysis of inspected characteristics, t-test<sup>16</sup> from Minitab computer program<sup>17</sup> was used.

## RESULTS

Slaughtering Characteristics: According to breed and sex groups, mean values of slaughtering traits of lambs were presented in Table 1.

The highest slaughtering weight of lambs was found in Red Karaman males (42.48kg) and the highest hot carcass weight was found in Tushin males (19.35kg). The mean values of hot dressing percentage of four slaughter groups were

Table 1. The mean values of slaughtering traits of Tushin and Red Karaman lambs (n=5).  
Tablo 1. Tuj ve Morkaraman kuzuların kesim özelliklerine ait ortalama değerler (n=5).

Slaughter Traits	Male				P	Female				P
	Tushin		Red Karaman			Tushin		Red Karaman		
	$\bar{X}$	S $\bar{x}$	$\bar{X}$	S $\bar{x}$		$\bar{X}$	S $\bar{x}$	$\bar{X}$	S $\bar{x}$	
Slaughter wt. (kg)	41.36	1.51	42.48	1.18	-	32.72	1.75	37.80	1.65	-
Hot carcass wt. (kg)	19.35	0.88	18.95	0.83	-	15.37	1.15	16.78	0.81	-
Hot carcass dressing percentage (%)	46.78	1.03	44.61	1.07	-	46.97	1.78	44.39	0.69	-
Skin wt. (%)	4.06	0.17	3.95	0.05	-	3.77	0.26	4.07	0.29	-
Feet wt. (g)	826.3	39.5	996.7	21.4	-	659.0	32.2	754.0	20.2	-
Head wt. (kg)	2.16	0.08	2.31	0.07	-	1.50	0.06	1.57	0.03	-
Liver wt. (g)	546.3	27.7	526.1	17.1	-	404.8	32.8	401.2	27.3	-
Lung wt. (g)	496.6	35.0	503.7	15.8	-	409.0	37.9	427.2	30.0	-
Heart wt. (g)	163.1	11.2	165.0	14.1	-	153.6	4.43	161.2	5.94	-
Spleen wt. (g)	85.5	11.2	82.6	9.36	-	114.0	29.9	78.4	10.4	-
Testicles wt. (g)	236.9	22.2	273.4	34.6	-	-	-	-	-	-
Internal fat wt. (g)	313.2	87.1	322.0	107.0	-	397.2	74.1	599.0	161.0	-
4 Stomachs wt <sup>a</sup> . (kg)	1.14	0.17	1.55	0.05	-	1.14	0.10	1.42	0.11	-
Small intestine wt <sup>a</sup> . (g)	865.3	31.0	860.9	43.7	-	548.8	22.5	652.4	34.4	-

<sup>a</sup>: empty wt., \*: P<0.05

**Table 2.** The mean values of carcass characteristics of Tushin and Red Karaman lambs (n=5).  
**Tablo 2.** Tuj ve Morkaraman kuzuların karkas özelliklerine ait ortalama değerler (n=5).

Carcass Characteristics	Male				Female			
	Tushin		Red Karaman		Tushin		Red Karaman	
	$\bar{X}$	S $\bar{x}$	$\bar{X}$	S $\bar{x}$	$\bar{X}$	S $\bar{x}$	$\bar{X}$	S $\bar{x}$
Cold carcass wt. (kg)	18.53	0.90	18.58	0.85	14.95	1.18	16.29	0.83
Cold carcass dressing percentage (%)	44.80	1.09	43.74	1.12	45.69	1.96	43.10	0.77
Leg wt. (kg)	5.66	0.14	6.04	0.24	4.63	0.28	5.36	0.21
Shoulder wt. (kg)	2.95	0.12	3.26	0.15	2.42	0.15	2.72	0.08
Loin wt. (kg)	1.30	0.08	1.36	0.07	1.17	0.12	1.23	0.11
Back wt. (g)	1.31	0.10	1.55	0.34	1.27	0.17	1.32	0.24
Remainders wt. (kg)	3.83	0.50	3.74	0.65	2.90	0.67	3.45	0.50
Kidneys wt. (g)	101.3	6.04	115.9	3.88	83.6	5.97	94.0	5.22
Kidneys fat wt. (g)	64.5	4.54	88.4	17.7	100.6	24.8	142.8	21.5
Fat tail wt. (kg)	2.85	0.53	2.10	0.17	1.94	0.39	1.52	0.26
Eye-muscle area (cm <sup>2</sup> )	9.84	0.37	10.46	0.54	8.90-	0.51-	10.00	0.49

44.39-46.97% with no significant difference between each other.

The differences of mean values for investigated slaughtering characteristics were no significant between genotypes within same sex groups, except feet weight.

**Carcass Characteristics:** The mean values of inspected carcass characteristics for each slaughter group were given in Table 2.

The lowest cold carcass weight was found in Tushin female lambs. The mean values of cold dressing percentage for male and female groups were 43.74-44.80% and 43.10-45.69% respectively.

There were no statistical differences between Tushin and Red Karaman genotypes within same sex groups for all investigated carcass characteristics.

## DISCUSSION

In this study, slaughter weights of Tushin and Red Karaman male lambs compared to the results in references, were found higher than those reported by Aksoy<sup>4</sup> and İlaslan and Geliyi<sup>5</sup> for Tushin and Red Karaman lambs. These results were also higher than the values reported by Karaca et al.<sup>11</sup> for Karakas lambs, but were lower than the results given for Tushin lambs by Macit et al.<sup>3</sup>.

Cold carcass weights of male lamb groups in this

study were higher than the values reported by Karaca et al.<sup>11</sup> for Karakas lambs and was close to given for Tushin and Red Karaman by İlaslan and Geliyi<sup>5</sup>, but were lower than the results of some studies<sup>3,4,7-10,12-14</sup>.

Leg weights of male lamb groups were found higher than given for Tushin<sup>3-5</sup> and Red Karaman<sup>4,7</sup> but were lower than the results of other studies<sup>8-10</sup>.

Shoulder weights of male lamb groups in this study were determined to be higher than given for Tushin and Red Karaman by Ulusan et al.<sup>6</sup> and similar to the results for the same breeds reported by Aksoy<sup>4</sup>, but were lower than given for the other genotypes results<sup>8-10</sup>.

Loin weights of male lamb groups were higher than the results given for Tushin and Red Karaman lambs<sup>4-7</sup> and were similar to the result given for Tushin lambs by Macit et al.<sup>3</sup>, but were lower than given for the results of the crossbred genotypes<sup>9,10</sup> by Akmaz et al.<sup>9,10</sup>.

Back weights of Tushin and Red Karaman male lamb groups were found higher than those values given by Aksoy<sup>4</sup> and Ulusan et al.<sup>6</sup>; on the other hand found to be lower than values of some studies<sup>3,8-10</sup>.

Remainders weights of male lamb groups were determined to be higher than given for Tushin and Red Karaman by Ulusan et al.<sup>6</sup>, but were lower than the results given for same breeds by Aksoy<sup>4</sup>.

Fat tail weights of male lamb groups were determined to be higher than given for Tushin by İlaslan and Geliyi<sup>5</sup> and crossbred genotypes reported by Akmaz et al.<sup>9,10</sup>, but were lower than given by the other studies results for Tushin and Red Karaman<sup>3-5,7</sup>.

In this study, cold carcass dressing percentage and eye muscle area values of male lamb groups were determined to be lower than the results of fattened lambs<sup>3-5,7-10,14</sup>.

This study reflected the local lamb breeding practice in Kars province. Similar slaughter and carcass performances were observed between Tushin and Red Karaman lambs that are dominating breeds in the region. But these results were lower than published results of some studies that were carried on fattened lambs. Due to short pasture season in the region, it may be suggested that intensive feeding might be applied on lambs after pasture season to increase meat production before slaughter.

## REFERENCES

- 1 **Anonymous:** Tarımsal Yapı. T.C. Devlet İstatistik Enstitüsü. Ankara. 1998.
- 2 **Akçapınar H:** Koyun Yetiştiriciliği. İsmat Matbaacılık Ltd. Şti. Ankara. 2000.
- 3 **Macit M, Karaoğlu M, Yaprak M, Kopuzoğlu S:** Tuj erkek kuzuların entansif şartlardaki besi performansları ile kesim ve karkas özellikleri. *Atatürk Üniv Ziraat Fak Derg.* 1997; 28(1): 64-73.
- 4 **Aksoy AR:** Farklı kesim ağırlıklarında morkaraman ve tuj erkek kuzularının besi performansı kesim ve karkas özellikleri. *Ankara Üniv Veteriner Fak Derg.* 1995; 42:15-23.
- 5 **İlaslan M, Geliyi C:** Altı aylık erkek Morkaraman ve Tuj kuzularının besi gücü ve bazı karkas özellikleri. Kars Deneme ve Üretim İstasyonu. Kars. Yayın No:8. 1979.
- 6 **Uluslan HOK, Aksoy AR, Karabulak C, Laçın E:** Merada beslenen morkaraman, tuj ve bunların melezi erkek tokluların kesim ve karkas özellikleri. *Ankara Üniv Veteriner Fak Derg.* 1996; 2: 28-33.
- 7 **Macit M, Yaprak M, Aksoy A:** Morkaraman erkek kuzuların entansif şartlardaki besi performansları ile kesim ve karkas özellikleri. *Yüzüncü Yıl Üniv Ziraat Fak Derg.* 1996; 6(2): 61-74.
- 8 **Oğan M:** Karayaka erkek kuzuların besi performansı ve karkas özellikleri. *Lalahan Hay Araşt Enst Derg.* 2000; 40(2): 37-44.
- 9 **Akmaz A, Tekin ME, Kadak R, Gürkan M:** Alman Siyah Başlı x İvesi (F1) ve Hampshire Down x İvesi (F1 ve G1) melezi erkek kuzuların besi performansı ve karkas özellikleri. *Türk Vet ve Hay Derg.* 2000, 24: 17-24.
- 10 **Akmaz A, Tekin ME, Tepeli C, Kadak R:** Alman Siyah Başlı x Akkaraman ve Hampshire Down x Akkaraman Melezi (F1 ve G1) erkek kuzuların besi performansı ve karkas özellikleri. *Türk Vet ve Hay Derg.* 2000, 24: 7-15.
- 11 **Karaca O, Vanlı Y, Kaygısız A, Altın T, Demirel M:** Karakaş erkek kuzularının besi ve karkas özellikleri. *Yüzüncü Yıl Üniv Ziraat Fak Derg.* 1991; 1(1): 147-164.
- 12 **Aygün T, Demirel M, Gökdağ Ö, Çelikyürek H, Kor A:** Farklı sürelerde süten kesilen ve meraya ek olarak kesif yemle beslenen karakaş kuzularının kesim ve karkas özellikleri. *Yüzüncü Yıl Üniv Ziraat Fak Tarım Bil Derg.* 1998; 8:9-16.
- 13 **Kor A, Cedden F, Ertuğrul M:** Dorset Down x Akkaraman (G1), Dorset Down (G1) x Akkaraman ve Akkaraman Erkek tokluların kesim ve karkas özellikleri. *Yüzüncü Yıl Üniv Ziraat Fak Tarım Bil Derg.* 1998; 8:1-7.
- 14 **Tufan M, Akmaz A:** Güney Karaman (Karakoyun), Kangal-Akkaraman ve Akkaraman kuzularının farklı kesim ağırlıklarında kesim ve karkas özellikleri. *Türk Vet ve Hay Derg.* 2001; 25(4): 495-504.
- 15 **Akçapınar H, Tekin ME, Kadak R:** Kuzu karkas parçalama ve parça fiyatlarının belirlenmesinde kullanılacak katsayıların hesaplanması. *Türk Vet ve Hay Derg.* 1996; 20: 9-14.
- 16 **Evrin M, Güneş H:** Biyometri. İstanbul Üniv. Veteriner Fak. İstanbul. Ders Notu No:81. 1998.
- 17 Minitab for Windows, Release 10. Minitab Inc. 1994; USA.