



ERCIYES ÜNİVERSİTESİ VETERİNER FAKÜLTESİ DERGİSİ Journal of Faculty of Veterinary Medicine, Erciyes University

Research Article/Araştırma
Makalesi 22(2), 112-118, 2025
DOI: 10.32707/ercivet.1641391

Slaughter and Carcass Traits of Male Kids Called as Manavlı Goat *

Büşra AKÇAY^{1,a}, Aykut Asım AKBAŞ^{2,b}, Mustafa SAATCI^{3,c}

¹Caranoglu Trading Joint Stock Company, Antalya-TÜRKİYE

²Burdur Mehmet Akif Ersoy University, Faculty of Veterinary Medicine, Department of Animal Science, Burdur-TÜRKİYE

³Muğla Sıtkı Koçman University, Fethiye Faculty of Agriculture, Department of Animal Science, Muğla-TÜRKİYE

ORCID No: ^a0009-0000-4704-7920; ^b0000-0003-2235-9439; ^c0000-0003-3697-8804

Corresponding author: Aykut Asım AKBAŞ, E-mail: icould_akbas@hotmail.com

How to cite: Akçay B, Akbaş AA, Saatci M. Slaughter and carcass traits of male kids called as Manavlı goat. Erciyes Univ Vet Fak Derg 2025; 22(2): 112-118

Abstract: The study was planned to determine the slaughter and carcass characteristics of the kids of Manavlı goats raised only/purely under breeder conditions in Denizli province. A total of 12 male kids at live weight of 34-36 kg at five months of age were slaughtered. In the study, hot dressing percentage based on pre-slaughter liveweight was 41.37%. While the cross-sectional area of the M. longissimus dorsi (MLD) was found to be 12.46 cm², the back fat thickness fat value was determined to be 0.74 mm. In the study, the carcass length, rump circumference, rump width, chest circumference, and chest width were 75.15 cm, 54.80 cm, 18.52 cm, 71 cm, and 18.91 cm, respectively. Additionally, the percentages of valuable carcass parts, such as the shoulder, ribs, and long leg, were determined to be 20.75%, 26.09%, and 31.97%, respectively. The study is the first research to examine the slaughter and carcass characteristics of male kids of Manavlı goats, which are a native genetic resource raised under local breeder condition and not yet sufficiently defined. It was thought that obtained results from this study will be a database for the following studies.

Keywords: Carcass, kid, Manavlı, slaughtering

Manavlı Olarak Adlandırılan Keçilerin Erkek Oğlaklarının Kesim ve Karkas Özellikleri

Öz: Bu çalışma Denizli ilinde halk elinde saf olarak yetiştirilen, Manavlı keçilerinin erkek oğlaklarının kesim ve karkas özelliklerini belirlemek için yapılmıştır. Çalışmada 34-36 kg arasında kesim öncesi canlı ağırlığa ulaşan 5 aylık yaştaki 12 erkek oğlak kesime sevk edilmiştir. Çalışmada kesim öncesi canlı ağırlığa göre hesaplanan sıcak karkas randımanı değeri %41.37 olarak belirlenmiştir. Yine, M. longissimus dorsi (MLD) alanı 12.46 cm² olarak bulunurken; kabuk yağı kalınlığı ise 0.74 mm olarak belirlenmiştir. Karkas ölçülerinden karkas uzunluğu, sağrı çevresi, sağrı genişliği, göğüs çevresi ve göğüs genişliği değerlerinin sırasıyla 75.15 cm, 54.80 cm, 18.52 cm, 71 cm ve 18.91 cm olduğu görülmüştür. İlave olarak çalışma kapsamında ön kol, kaburga ve uzun but gibi önemli karkas parçalarının yüzde oranları sırasıyla %20.75, %26.09 ve %31.97 olarak belirlenmiştir. Çalışma halk elinde yetiştirilen ve henüz yeterince tanımlanmamış yerli bir gen kaynağı olan Manavlı olarak adlandırılan keçilerinin erkek oğlaklarının kesim ve karkas özelliklerine ilişkin ilk araştırma niteliğindedir. Çalışma sonuçlarının ileride yapılacak araştırmalar bir veri tabanı oluşturacağı düşünülmektedir.

Anahtar kelimeler: Karkas, kesim, Manavlı, oğlak

Introduction

The selection of animals for farming is influenced not only by factors such as regional conditions but also by the type of product intended to be obtained and targeted. In this regard, farming activities can be carried out based on the desired products, such as meat, milk, or mohair (Ceyhan et al., 2015).

Goat farming, which is primarily preferred by those living in rural areas, can utilize the natural resources

in its surrounding geography more efficiently compared to other types of livestock farming, with relatively lower costs. Furthermore, the ability of goats to produce products by utilizing feed resources that are not sufficiently exploited by other livestock species increases the significance of goat farming (Çelik and Olfaz, 2017). Goat farming is practiced not only for milk production but also for meat yields. It has been noted that goat meat is less watery and leaner compared to sheep carcasses, which could be important factors in consumer preferences (Webb et al., 2005).

In Türkiye, sheep and goat breeding, especially goat breeding, is carried out in small and irregularly structured family enterprises. Goat farming, which holds a privileged position within small livestock farming, is mainly practiced in forested and border regions (Dellal and Erkuş, 2000). The total number of farm

Geliş Tarihi/Submission Date : 17.02.2025

Kabul Tarihi/Accepted Date : 03.06.2025

*This study was prepared from the first author's Master thesis and was supported financially by the Burdur Mehmet Akif Ersoy University Scientific Research Projects Commission, Project No: 0930-YL-23.

animals in Türkiye has surpassed 70 million, with goats constituting approximately 15% of this figure. The Mediterranean, Southeastern Anatolia, and Aegean regions are the primary geographical areas for goat populations (TUIK, 2024).

The fact that the Turkish Hair goats, which have such a large population in different geographical regions, possess various types and varieties, requires the identification of their distinct characteristics. Additionally, it should be considered that, previously referred to collectively as Turkish Hair goats, there may be animals with different structural characteristics in terms of both morphological and physiological breed traits. Although there has been a significant increase in studies aimed at identifying all possible varieties and the potential emergence of new breeds from native goat genetic resources in Türkiye, it can still be said that there are not enough. For this purpose, the Manavlı goat genotype, which has never been previously introduced to the scientific community, is believed to have been raised for many years in certain areas of Western Anatolia. This genotype, named after the Manavlı Nomads, is claimed to have high birth weight, rapid growth capacity, and a large body structure (Akbaş et al., 2023). The purpose of this study was to detect slaughter and carcass traits of Manavlı male kids raised under breeder conditions.

Material and Methods

Animals and Data Collection

In order to reveal the fattening, slaughter and carcass characteristics, single male kids were purchased from the breeders in Denizli province (latitude 39°20' and 40°30' N, longitude 26°30' and 28°30' E) that were born in March, 2024. Male single kids, were numbered with ear tags, were kept with their mothers at morning and night until the suckling period ended (approximately 75-90 days of age) under breeder conditions. No different management procedure was applied to the flocks during the experimental periods of the study. In the study, among 60 male kids, whose live weight values were determined at 30-day intervals from birth to 5 months of age, a total of 12 male kids that first reached a pre-slaughter live weight of 34-36 kg were transported to a commercial slaughterhouse in the province of Burdur without causing unnecessary distress on them by ensuring the welfare conditions. On the day of slaughter, their pre-slaughter live weights were recorded after they were deprived of food (for 12 h) but allowed free access to water. After the preslaughter live weights of kids were detected, slaughter characteristics such as skin, feet, head and red organs (lungs and trachea, liver, heart, spleen) were recorded using a scale with 50-g precision. Then the hot carcass weights were detected. The hot carcasses were chilled for 24 h at 4°C and re-weighed. Hot and cold carcass dressing

percentages were calculated based on live weight before the slaughter. Additionally, chilling lost value was determined between the differences of hot and cold carcass weights. Some of carcass measurements such as the carcass length, the rump circumference, rump width, chest circumference and chest width were carried out by using a measuring stick and measuring tape. Then carcasses were split into two equal part. The left side was separated into five joints as described by Colomer-Rocher et al. (1987) (Figure 1), they were weighed. Percentages of the valuable carcass parts were calculated based on cold carcass weight.

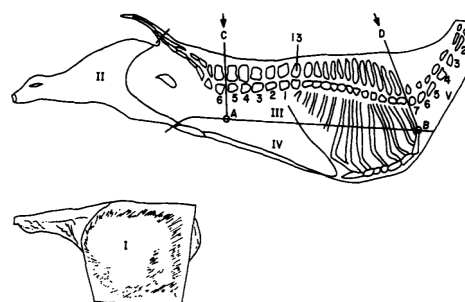


Figure 1. Scheme for jointing the left side of a goat carcass

I: Shoulder, II: Long leg, III: Ribs, IV: Flank, V: Neck

A digital plot was used in order to detect the fat thickness. Additionally, the M. Longissimus dorsi (MLD) area was detected by using drawing software as stated by Akbaş (2013). A digital caliper with a sensitivity of 0.01 mm, an accuracy of ± 0.01 mm (< 100 mm) and a repeatability of 0.01 mm. was also used in order to determine the backfat thickness.

The study was approved by the Burdur Mehmet Akif Ersoy University Local Ethics Committee on Animal Experiments (29.03.2023, resolution number: 1036).

Minitab (2019) statistical software packaged was used for examining the data. An intense descriptive statistical analysis was applied on the data with the means and standart errors of means. The coefficient of variances was presented to indicate the reliability of the data in the study. Additionally, Pearson correlation coefficients were calculated to determine the relationship between some of the slaughter and carcass characteristics examined from the data obtained in the study.

Results

Slaughter and carcass characteristics of Manavlı male kids and relations between some of them were presented in Tables 1-4. The average preslaughter weights of Manavlı male kids were found to be 35.22 kg. The hot carcass weight was determined to be

14.57 kg, with a dressing percentage of 41.37%. In the study, the average cold carcass weight was found to be 14.34 kg, with a chilling loss of 1.58%, and a cold dressing percentage of 40.72%. Additionally, the M. longissimus dorsi (MLD) area was found to be 12.46 cm², and the back fat thickness was determined to be 0.74 mm. The study also showed that the carcass length, rump circumference, rump width, chest circumference, and chest width were 75.15 cm, 54.80 cm, 18.52 cm, 71 cm, and 18.91 cm, respectively.

Phenotypic correlation coefficients (r) between some carcass traits were presented in Table 3. High positive correlations were calculated between the relevant feature ($P < 0.05-0.001$). While the highest positive correlation coefficient (0.922) was between slaughter weight and M. Longissimus dorsi area, a relatively low correlation coefficient (0.645) was determined between back fat thickness and cold carcass weight compared to other characteristics.

Table 1. Certain slaughter and carcass characteristics of Manavlı male kids ($\bar{x} \pm S_{\bar{x}}$)

Traits	Values	CV%
Slaughter weight (kg)	35.22±1.45	7.49
Hot carcass weight (kg)	14.57±0.68	9.61
Dressing percentage, %	41.37±0.25	8.25
Head weight (g)	2029.06±19.57	7.40
4 Feet weight (g)	1203.44±21.23	9.17
Skin weight (g)	2687.92±20.29	9.13
Lungs and trachea weight (g)	521.10±19.45	8.12
Heart weight (g)	146.05±4.29	10.16
Liver weight (g)	688.06±10.05	8.15
Spleen weight (g)	70.02±0.45	9.25
Full stomach weight (g)	4529.30±51.01	10.11
Full intestine weight (g)	2492.44±23.79	9.48
Internal fat weight (g)	159.51±3.25	9.17

$\bar{x}$: Mean $S_{\bar{x}}$: Standart error of mean CV: Coefficient of variance

Table 2. Certain cold carcass characteristics of Manavlı male kids ($\bar{x} \pm S_{\bar{x}}$)

Traits	Vaues	CV%
Cold carcass weight (kg)	14.34±0.50	9.49
Chilling loss (%)	1.58±0.07	7.23
Dressing percentage, %	40.72±0.38	8.05
Left half of carcass weight (kg)	7.29±0.31	9.07
Shoulder weight (g)	1513.03±43.11	9.22
Flank weight (g)	695.13±25.39	9.56
Neck weight (g)	786.05±43.27	8.19
Ribs weight (g)	1946.28±54.11	10.31
Sirloin weight (g)	1510.63±26.06	9.75
Loin weight (g)	436.11±38.01	9.78
Long leg weight (g)	2331.19±72.05	8.39
Back fat thickness (mm)	0.74±0.07	9.40
M. Longissimus dorsi area (cm ²)	12.46±0.47	8.24
Carcass length (cm)	75.15±0.90	8.03
Rump circumference (cm)	54.80±0.63	9.15
Rump width (cm)	18.52±0.47	8.79
Chest circumference (cm)	71.00±0.81	9.18
Chest width (cm)	18.91±0.70	9.27

$\bar{x}$: Mean $S_{\bar{x}}$: Standart error of mean CV: Coefficient of variance

Table 3. Phenotypic correlation coefficients (r) between some carcass traits

Traits	Slaughter weight (kg)	MLD area (cm ²)	Back fat thickness (mm)	Hot carcass weight (kg)
MLD area (cm ²)	0.922***			
Back fat thickness (mm)	0.856**	0.654*		
Hot carcass weight (kg)	0.830**	0.757*	0.719*	
Cold carcass weight (kg)	0.820**	0.790**	0.645*	0.987***

*, $P < 0.05$, **, $P < 0.01$, ***, $P < 0.001$ MLD: *Musculus Longissimus dorsi*

When examining Table 4, which presents the proportions of certain slaughtering characteristics in male kids of the Manavlı goat, the percentages of the head, legs, skin, lungs and trachea, full stomach, full intestines, and omental and mesenteric fat were found to be 5.76%, 3.41%, 7.62%, 1.48%, 12.85%, 7.02%, and 0.45%, respectively. Additionally, the percentage proportions of valuable carcass parts, such as the shoulder, ribs, and long leg, were determined to be 20.75%, 26.69%, and 31.97%, respectively.

Studies on determining the meat production of sheep and goat farming are generally based on the principles of assessing the growth characteristics of the offspring, establishing suitable feeding models, and subsequently determining the carcass characteristics of the animals. The dressing percentage value, which is influenced by numerous factors related to the animal and its care and nutrition generally increases with the rise in pre-slaughter live weight (Warmington and Kirton, 1990).

Table 4. Percentages of the valuable parts and slaughtering characteristics in Manavlı male kids ($\bar{x} \pm S_{\bar{x}}$)

Traits	Values	CV%
Percentages (%) relative to cold carcass weight		
Shoulder	20.75±0.44	8.41
Flank	9.54±0.16	7.27
Neck	10.78±0.11	8.13
Ribs	26.69±0.62	9.74
Sirloin	20.71±0.16	9.19
Loin	5.98±0.04	9.27
Long Leg	31.97±0.41	7.39
Percentages (%) relative to slaughter weight		
Head	5.76±0.11	9.85
4 Feet	3.41±0.12	10.01
Skin	7.62±0.23	9.46
Lungs and Trachea	1.48±0.07	9.17
Heart	0.42±0.03	8.70
Liver	1.96±0.04	8.64
Spleen	0.20±0.02	9.37
Full stomach	12.85±0.25	8.86
Full intestine	7.02±0.11	9.10
Internal Fat	0.45±0.06	8.40

$\bar{x}$: Mean $S_{\bar{x}}$: Standard error of mean CV: Coefficient of variance

Discussion and Conclusion

The coefficient of variation, which is one of the most appropriate prevalence measures for comparing data series with different means in terms of variation, is below 10 percent, indicating that the data are very homogeneous (Tekin, 2010). In the study, lots of coefficient of variance (%91.66, 44/48) values for slaughter and carcass traits presented in tables were under %10. This situation shows that the data presented are quite homogeneous, based on the slaughtering and data collection procedures carried out under controlled conditions.

In the study, hot and cold dressing percentage values were detected as 41.37% and 40.72%, respectively. These values are higher than those reported by Gökdağ (2013) for Alpine x Hair goat (F1), Saanen x Hair goat (F1) crosses, and male Turkish Hair goat kids; however, they are compatible with the values stated by Oral Toplu et al. (2010) for male Turkish Hair goat kids under breeder conditions. Although there are studies (Koyuncu et al., 2007; Atay et al., 2011; Yılmaz et al., 2010) reporting relatively higher values than those detected for male Turkish Hair goat kids, Akbaş and Saatçı (2016) and Elmaz et al.

(2017) reported higher yield values for male Honamlı goat kids. It is stated that dressing percentages in goats can vary between 35% and 53% due to the influence of various factors (Warmington and Kirton, 1990). The relatively low percentages observed in this study, which are affected by breeder conditions, suggest that positive differences and higher values could be achieved in the aforementioned values for the Manavlı goat through studies conducted under more controlled conditions, where the animals' fattening performance is also considered, using different experimental designs.

Since the hot, cold carcass weights and MLD area which are economically important, they were tried to be estimated like the growth characteristics. So, slaughter weight is one of the main factor for hot and cold carcass weights and MLD cross sectional area. In the study, strong positive correlations were determined between pre-slaughter live weight and both hot and cold carcass weights, with correlation coefficients of 0.830 and 0.820, respectively. Similarly, Stanford et al. (1995), in their study on Alpine goats using ultrasound to assess certain carcass traits, and Rahman (2007), who investigated Bengal goats divided into three different groups, reported a correlation coefficient of 0.85 between live weight and hot carcass weight. In the present study, high and positive phenotypic correlation coefficient (0.922) were defined between slaughter weight and MLD area. It is known that there is a relationship between MLD and the amount of quality meat in the carcass. MLD is affected by factors such as cross-sectional area, genotype, applied fattening method, and slaughter live weight (Daşkiran et al., 2010).

As subcutaneous fat increases, the amount of water lost by evaporation from the carcass surface decreases, thus reducing chilling loss (Dhanda et al., 2003). The back fat thickness value (0.74 mm), which is one of the important criteria determining the fatness levels of the carcasses, was higher than Koşum et al. (2003), Yılmaz et al. (2010), and Özcan et al. (2010), reports. Contry to this, Gül (2004) and Koyuncu et al. (2007) reported higher values than the current study. The higher back fack thickness might be associated with the fact that the lower chilling loses for Manavlı kids.

In the study, MLD area value were defined as 12.46 cm² for Manavlı male kids. It is relatively in parallel with the values reported by Akbaş and Saatçı (2016) for Honamlı x Hair goat crossbred kids. However, it is higher than the values reported by Aktaş et al. (2015) for Honamlı breed kids. Furthermore, it is higher than the values reported by Akman et al. (1991) and Erol (2015) for Ankara goat kids with pre-slaughter live weights around 30-31 kg. Therefore, it was thought that the differences on MLD value was associated with slaughter live weight of kids.

Carcass measurements can be influenced by factors such as breed, gender, slaughter age, live weight at slaughter, and feeding conditions (Erol, 2015). When the carcass measurements in this study are generally examined, various researchers (Cameron et al., 2001; Dhanda et al., 2003; Koşum et al., 2003; Gökdağ, 2013) reported higher values than the current study. They are generally consistent with the values reported by Akbaş and Saatçı (2016) and Elmaz et al. (2017) for male Honamlı goat kids. Variation in the values reported on carcass measurements within the literature is likely attributable to differences in rates of growth, slaughter age and slaughter weight and also feeding system.

When considering the percentages of significant carcass parts for consumption, the determined values for the shoulder (20.75%), ribs (26.69%), and long leg (31.97%) were found to be lower than the values reported by Akbaş and Saatçı (2016) and Aktaş et al. (2015) for the long leg percentage in Honamlı male kids. Additionally, Koşum et al. (2003), Pena et al. (2007), Bonvillani et al. (2010), and Daşkiran et al. (2010) reported higher values than these values. However, they were in parallel with the values reported by Kor et al. (2011) and Atay et al. (2011). These differences among the studies may be due to slaughter weight and rearing conditions.

The value for the percentage of the head (5.76%) determined in this study is relatively lower compared to the values reported by Atay et al. (2011). It is reported that as the pre-slaughter live weight of the kids increases, the head ratio in the carcass will decrease relatively (Erol, 2015). Therefore, it is thought that the differences observed for the values specified in the study may be due to different pre-slaughter live weights. Additionally, the skin percentage (7.62%) is consistent with the values reported by Koyuncu et al. (2007) for Turkish Hair goats at various slaughter weights, as well as by Özcan et al. (2010) for Saanen, Gökçeada, and Maltız kids. However, it is lower than the values reported by Akbaş and Saatçı (2016) and Elmaz (2017) for Honamlı kids, and by Erol (2015) for Ankara goat kids. Especially the differences between skin percentages might be associated with the less intense and less long hair production of Manavlı kids.

In the study, it has been observed that the average slaughter weight values of male Manavlı goat kids are higher than those of many local goat breeds, particularly the Turkish Hair goat for the 150th day of age. Furthermore, in terms of carcass measurements, positive differences were found in Manavlı goat kids compared to the reports on Turkish Hair goats in the literature. This study is important because it is the first to reveal the potential of Manavlı goat kids, a native genetic resource that is raised under local breeder condution and has not yet been

sufficiently studied from a scientific perspective, in terms of their carcass characteristics. It is believed that the results obtained from this study could make a positive contribution to biodiversity and the production spectrum.

References

- Akbaş AA, Saatçı M, Elmaz Ö, Yazıcı C. The first data of a newly recorded native goat genotype called Manavlı in Türkiye: growth traits of kids. *Turk J Vet Anim Sci* 2023; 47: 413-24.
- Akbaş AA, Saatçı M. Slaughter and carcass characteristics of Honamlı and Honamlı x Hair (F1) goat male kids reared under extensive conditions. *Erciyes Üniv Vet Fak Derg* 2016; 13(2): 120-30.
- Akbaş AA. Comparative Investigation of Growth and Carcass Characteristics of Honamlı, Hair Goat and Honamlı x Hair Goat Crossbred Kids Reared Under Extensive Conditions. PhD Thesis, Burdur MAKÜ Institute of Health Sci, Burdur 2013; p. 46.
- Akman M, Ertuğrul M, Tatayoğlu A, Kor A, Yavuzer AÜ. Slaughter and carcass characteristics of Angora goat. *Lalahan Hay Araşt Enst Derg* 1991; 31: 39-47.
- Aktaş AH, Gök B, Ateş S, Tekin ME, Halıcı İ, Baş H, Erduran H, Kassam S. Fattening performance and carcass characteristics of Turkish indigenous Hair and Honamlı goat male kids. *Turk J Vet Anim Sci* 2015; 39(6): 643-53.
- Atay O, Gökdağ Ö, Özüğür AK, Eren V. Relationships between udder measurements and milk yield characteristics of Hair goats in rural conditions. VII. National Animal Science Congress. September 14-16, 2011; Adana-Türkiye.
- Bonvillani A, Pena F, De Gea G, Gomez G, Petryna A, Perea J. Carcass characteristics of Criollo Cordobes kid goats under an extensive management system: Effects of gender and liveweight at slaughter. *Meat Sci* 2010; 86: 651-59.
- Cameron MR, Luo J, Sahlu T, Hart SP, Coleman SW, Goetsch AL. Growth and slaughter traits of Boer x Spanish, Boer x Angora, and Spanish goats consuming a concentrate-based diet. *J Anim Sci* 2001; 79: 1423-30.
- Ceyhan A, Ünal A, Çınar M, Serbest U, Şekeroğlu A, Akyol E, Yılmaz E, Demirkoparan A. A research on structural characteristics and problems of goat breeding in Niğde. *Turkish JAF Sci Tech (TURJAF)* 2015; 3(2): 74-9.
- Colomer-Rocher F, Morand-Fehr P, Kirton AH. Standard methods and procedures for goat carcass evaluation, jointing and tissue separation. *Livest Prod Sci* 1987; 17: 149-59.
- Çelik HT, Olfaz M. 6th month body measurements of Hair goat and Saanen x Hair (F1, B1 and B2) crossbred kids and determination of the factors affecting these measurements. *Akademik Ziraat Dergisi* 2017; 6(2): 161-8.
- Daşkiran İ, Bingöl M, Karaca S, Yılmaz A, Cetin AO, Kor A. The effect of feeding system on fattening performance, slaughter, and carcass characteristics of Norduz male kids. *Trop Anim Health Prod* 2010; 42(7): 1459-63.
- Dellal İ, Erkuş A. Antalya İlinde Kıl Keçisi Yetiştiriciliğine Yer Veren Tarım İşletmelerinin Ekonomik Analizi ve Planlanması. Ankara: Tarımsal Ekonomi Araştırma Enstitüsü Yayınları, 2000; No: 43.
- Dhanda JS, Taylor DG, Murray PJ. Growth, carcass and meat quality parameters of male goats: effects of genotype and liveweight at slaughter. *Small Rumin Res* 2003; 50: 57-66.
- Elmaz Ö, Akbaş AA, Saatçı M. Effects of birth type on growth, fattening performance and carcass characteristics in Honamlı male kids. *Kafkas Üniv Vet Fak Derg* 2017; 23(5): 749-55.
- Erol H. Fattening performance, slaughter and carcass traits and some meat quality traits at different slaughter weights of male and castrated Angora goat kids, PhD thesis, Ankara Univ Institute of Health Sci, Ankara 2015; p. 76.
- Gökdağ Ö. Growth, slaughter and carcass characteristics of Alpine x Hair goat, Saanen x Hair goat and Hair goat male kids fed with concentrate in addition to grazing on rangeland. *Small Rumin Res* 2013; 109: 69-75.
- Gül S. Fattening performance and carcass characteristics of Awassi sheep and Damascus goat yearlings fattened at the same age, Master thesis, Mustafa Kemal Univ Institute of Sci, Hatay 2004; p. 50.
- Kor A, Karaca S, Ertuğrul M. Effect of different housing systems on fattening performance, slaughter and carcass characteristics of Akkeçi (White Goat) male kids. *Trop Anim Health Prod* 2011; 43: 591-6.
- Koşum N, Alçiçek A, Taşkın T, Önenç A. Fattening performance and carcass characteristics of Saanen and Bornova male kids under an intensive management system. *Czech J Anim Sci* 2003; 48 (9): 379-86.
- Koyuncu M, Duru S, Kara US, Öziş S, Tuncel E. Effect of castration on growth and carcass traits in Hair goat kids under a semi-intensive system in the South- Marmara region of Turkey. *Small Ru-*

- min Res 2007; 72(1): 38-44.
- Minitab, 2019: Windows User's Guide. Version 19.1.1. Minitab Inc, State College, PA, USA.
- Oral Toplu HD, Göksoy EÖ, Nazlıgül A. Slaughter and carcass traits of Hair goats raised under extensive conditions. III. National Veterinary Animal Science Congress. July, 15-18, 2010; Afyon-karahisar-Türkiye.
- Özcan M, Yılmaz A, Ekiz B, Tölü C, Savaş T. Slaughter and carcass characteristics of Gokceada, Maltese and Turkish Saanen suckling kids. Arch Tierz 2010; 53(3): 318-27.
- Pena P, Perea J, Garcia A, Acero R. Effects of weight at slaughter and sex on the carcass characteristics of Florida suckling kids. Meat Sci 2007; 75: 543-50.
- Rahman F. Prediction of carcass weight from the body characteristics of Black Bengal goats. Intl J Agric Biol 2007; 9(3): 431-4.
- Stanford K, McAllister TA, MacDougall M, Bailey DRC. Use of ultrasound for the prediction of carcass characteristics in Alpine goats. Small Rumin Res 1995; 15: 195-201.
- Tekin ME. Sağlık Bilimleri İçin Örneklerle Bilgisayarda İstatistik. Second Edition. Konya: Selçuk University Faculty of Veterinary Medicine, Department of Biostatistics, 2010.
- TÜİK. Hayvancılık İstatistikleri <https://data.tuik.gov.tr/Bulten/Index?p=Hayvancilik-Istatistikleri-Haziran-2024-53811>. Accessed date: 25.12.2024.
- Warmington BG, Kirton AH. Genetic and non-genetic influences on growth and carcass traits of goat. Small Rumin Res 1990; 3: 147-65.
- Webb EC, Casey NH, Simela L. Goat meat quality. Small Rumin Res 2005; 60: 153-66.
- Yılmaz A, Ekiz B, Özcan M, Kaptan C, Hanoğlu H, Yıldırım M, Koçak K. Carcass quality characteristics of Hair Goat and Saanen x Hair Goat cross-bred kids from intensive production system. J Anim Feed Sci 2010; 19: 368-78.

