

Comparison of the Fleece Characteristics of Karakas and Norduz Sheep (Local Ewes in Turkey)

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Abstract: Data were collected from 10 Karakas and 10 Norduz sheep in Animal Science Breeding Farm, Yuzuncu Yil University, Turkey. Fleece characteristics in the sheep were investigated as greasy fleece weight (kg), clean fiber percentage (%), elasticity (%), breaking strength (g), fiber length (cm) and fiber diameter (μm). The sheep produced 1.836 ± 0.102 kg for average greasy fleece weight. Greasy fleece weight, clean fiber percentage, elasticity, breaking strength, fiber length were observed 1.72 ± 0.14 kg, $48.18 \pm 1.93\%$, $24.68 \pm 1.11\%$, 7.97 ± 1.02 g, 37.12 ± 1.49 mm for Karakas and same traits were determined 1.96 ± 0.14 kg, $55.76 \pm 2.53\%$, $29.66 \pm 1.88\%$, 10.95 ± 0.89 g and 41.54 ± 2.30 mm for Norduz were 1.72 ± 0.14 kg and 1.96 ± 0.14 kg, respectively. Karakas and Norduz were produced medium quality fibers. Therefore, homogeneity of the fleece is very important as well as fiber diameter. Karakas and Norduz sheep produced $30.13 \pm 1.52 \mu\text{m}$ and $32.24 \pm 1.18 \mu\text{m}$ for fiber diameter, respectively. Difference between breed of sheep have been significant for the clean fiber percentage, elasticity and breaking straight. Differences between breed and sex have not importance for other fleece traits.

Key words: Norduz sheep, Karakas sheep, Fleece characteristic

Introduction

Akkaraman sheep is the most common breed in East and Mid-Anatolian Region, Turkey (Ertugrul *et al.*, 1993). The Karakas and Norduz are varieties of the Akkaraman fat-tailed breed of sheep used for meat, milk and carpet-fleece production in Turkey (Bingol, 1998). The Karakas and Norduz sheep produces medium quality carpet fleece. The price paid for the fleeces is based on fleece characteristics, therefore, it is important to assess these traits and determine the potential for their improvement. Higher estimates of heritability have been reported for fleece characteristics in many breeds, therefore selection for desired traits might be useful (Tabba *et al.*, 2001). Moreover, fleece characteristics influence insulation values of the coat protecting the animal from the extremes heat and cold in Turkey. It has been reported that the body location of the fleece samples taken influences fleece characteristics (Tabba *et al.*, 2001 and Hanford *et al.*, 2005). Shoulder areas have longer, finer fibers with a lower percentage of medullated fibers than those from the mid-side and hip. Understanding the pattern of variation on the body would be useful in determining the most suitable sampling location for measuring fleece characteristics.

There have been conflicting reports in the literature regarding the effect of age on fleece characteristics. Many researchers found greasy fleece weight increased with advancing age. Tekerli *et al.* (2001) found increased Akkaraman breeds' greasy fleece weights with age. In this study, greasy fleece weights were found 2.07, 2.58 and 4.21 kg for mature ewes in different place born in year 1999 and 2000, respectively. As results from this study, fleece traits were most difference for age. Çolakoğlu and Ozbeyaz (1999) investigated comparison between Akkaraman and Malya sheep respecting some production traits. In this study, greasy fleece weights were found to be 2.464 kg and 2.364 kg for Akkaraman and Malya breed, respectively and difference between for fleece characteristics such as fiber length, fiber diameter and crimps were significant.

Fleece characteristics of Norduz and Karakas sheep are important for productivity of the sheep breeding in East-Anatolia, Turkey. Furthermore, especially Karakas is widest breed in East-Anatolia Region, Turkey. Therefore, investigating production traits such as fleece yields are important for the sheep breed. Moreover, there is very little information about fleece characteristics for Karakas and Norduz breeds. It is the only study on fleece characteristics about Norduz breeds investigated by Çivi (1999). Therefore, the objective was to investigate the fleece characteristics for Norduz and Karakas sheep.

Materials and Methods

Data were collected from 10 Karakas and 10 Norduz sheep in Animal Science Breeding Farm, Yuzuncu Yil University, Turkey.

Greasy fleece weights (kg) were obtained at shearing in late June. The research material was fleece samples taken from the mid-rib. Each fleece characteristics were determined with standard method in Lalahan Livestock Central

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Research Institute, Ankara, Turkey. Fleece characteristics in the sheep were investigated for greasy fleece weight (kg), clean fiber percentage (%), elasticity (%), breaking strength (g), fiber length (mm) and fiber diameter (μm).

Data for each fleece characteristics were analyzed effecting on breed and sex of sheep. Each of the sex groups is selecting from 2-3 years old.

Least squares procedures were used to analyze fleece characteristics. A general statistical model included the effect of sex and breed groups, on fleece traits, where applicable and residual error (SAS, 1998).

Results and Discussion

The sheep were produced 1.836±0.102 kg greasy fleece weight. Some descriptive statistics for Karakas and Norduz sheep were illustrated in the Table 1.

Fiber diameter is the most important trait related fleece characteristics due to the economical importance for making carpet. As overall results, in Karakas and Norduz were produced medium quality fibers. Therefore, homogeneity of the fleece is very important as well as fiber diameter. As we can see resulting of the variation coefficient for fiber diameter, it can be concluded homogeneity of the fiber diameter is acceptable limits for carpet industry. In general, acceptable limits for fiber diameters ranged from 10 to 70 μm in producing Carpet (Civi, 1999). Karakas and Norduz sheep producing 1.72±0.14kg and 1.96±0.14 kg greasy fleece weights produced 30.13±1.52 μm and 32.24±1.18 μm for fiber diameter, respectively.

Difference between Karakas and Norduz sheep for greasy fleece weights is insignificant. Effects of breed and sex groups on the fleece characteristic are summarized in Table 2.

According to Table 2, differences between breed of sheep have been significant ($P < 0.01$) on for the clean fiber percentage, elasticity and breaking straight. On the other hand, differences for breed and sex have not importance for other fleece traits. Civi (1999) had not observed a difference between Karakas and Norduz lamb for fleece characteristics. In general, effect of sex is not important on the fleece characteristics in Akkaraman sheep (Corekci and Evrim, 2000a). Furthermore, Tabbaa et al. (2001) noted that fleece characteristics have not importance differences among Awassi sheep at different sex and ages.

Corekci and Evrim (2000b) investigated on some production performance in Chios and Imroz sheep kept under semi-intensive condition. These researchers reported that there were importance differences among sex and breed for greasy fleece weight breaking straight.

According to results of fleece characteristics, Norduz sheep (1.96±0.14) have higher greasy fleece weight than Karakas (1.72±0.14). Clean fiber percentage, elasticity and breaking straight traits for Norduz obtained higher values than Karakas. Furthermore, variation coefficients for Norduz obtained generally lower than Karakas. This results indicated that Norduz sheep producing more uniform fleece than Karakas.

Table 1: Some descriptive fleece traits for Karakas and Norduz sheep

Traits	Karakas		Norduz		Overall	
	$\bar{x} \pm S_x$	CV	$\bar{x} \pm S_x$	CV	$\bar{x} \pm S_x$	CV
Greasy Fleece Weight (Kg)	1.72±0.14	26.27	1.96±0.14	23.16	1.84±0.10	24.88
Clean Fiber Percentage (%)	48.18±1.93	12.67	55.76±2.53	14.38	51.97±1.77	15.29
Elasticity (%)	24.68±1.11	14.22	29.66±1.88	20.08	27.17±1.21	19.88
Breaking Straight (g)	7.97±1.02	40.31	10.95±0.89	25.78	9.46±0.74	35.07
Fiber Length (Hauter, mm)	37.12±1.49	12.69	41.54±2.30	17.50	39.33±1.43	16.22
Fiber Diameter (μm)	30.13±1.52	15.93	32.24±1.18	11.64	31.19±0.97	13.89

Table 2: Analysis of variance results for wool characteristics

Traits	Breed			Sex			Error	
	DF	MS	F	DF	MS	F	DF	MS
Greasy Fleece Weight (Kg)	1	0.291	1.44	1	0.239	1.18	17	00.202
Clean Fiber Percentage	1	287.28	6.02*	1	101.82	2.13	17	47.720
Elasticity (%)	1	124.15	4.91*	1	0.175	0.01	17	25.300
Breaking Straight (g)	1	44.55	4.91*	1	10.27	1.13	17	09.070
Fiber Length (Hauter)	1	97.68	2.72	1	64.98	1.81	17	35.930
Fiber Diameter (μm)	1	22.34	1.15	1	2.77	0.14	17	19.500

* F values is significantly at 0.05 level

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As a result of present study all fleece traits except for greasy fleece weight for Karakas and Norduz were closely with reported by Civi (1999). However, greasy fleece weights of the Akkaraman and Malya sheep were reported as 2.45 ± 0.04 kg and 2.35 ± 0.03 kg, respectively. As compared with Akkaraman sheep and other local ewes in Turkey; clear fiber percentages were closely with reported value $51.41 \pm 1.52\%$ (Colakoglu and Ozbeyaz, 1999). Fiber length were substantially lower than Akkaraman and Malya sheep and fiber diameters were also closely with reported for this breeds (Colakoglu and Ozbeyaz, 1999) and Chios and Imroz sheep (Corekci and Evrim, 2000a, b).

Conclusions

Breeding objectives for sheep production are becoming more complex. Recently, meat, milk and fleece production were same important traits for sheep breeders. Therefore, breeding objectives have considered all these traits for sheep. Fleece characteristics were reported high relations each other (Safari *et al.*, 2004).

Norduz and Karakas sheep are suitable type of sheep for East Anatolia, in terms of adaptability and profitability. Therefore, fleece characteristics for these breeds were not adequately for carpet sector. In terms of the economically import fleece traits, there for no differences between Karakas and Norduz breed of sheep. However, claims in the industry as the favorable fiber sheep should be supported via sheep of good quality fleece.

Consequently, it is obvious that Karakas and Norduz local ewes in East Anatolia require improvement of fleece characteristics.

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