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The Wool Production Characteristics in Morkaraman and Chios X Akkaraman (F1) and Kivircik X Morkaraman (F1) Crossbred Sheep

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Abstract: This study was conducted with the aim of comparing wool production characteristics of Morkaraman, Chios x Morkaraman (F1) and kivircik x Morkaraman (F1) crossbreds. The study population consisted of 25 Morkaraman , Chios x Akkaraman (F1) and Kivircik x Morkaraman (F1) female cross-breeds, at first shearing (1 ¼) time. Dirty wool production values were 2.200 , 1.160 and 1.370 kg (P<0.001); staple length values were 15.525 , 10.517 and 11.955 cm (P<0.001) ; fiber diameter values were 36.716 , 33.170 and 31.897 μ (P<0.01); tenacity values were measured as 15.029 , 9.528 and 10.333 g (P<0.001) and elongation values were 34.858% , 30.789% and 33.184% (P<0.01) in Morkaraman, Chios x Akkaraman (F1) and Kivircik x Morkaraman (F1) genotypes, respectively. In all of these characteristics evaluated in the present study, Morkaramans showed the greatest values when compared to both crossbred groups. However, Morkaramans did not have any significant superiority in elongation values when compared to Kivircik x Morkaraman crossbreds (F1). Based on the results of this study, we might suggest that the rough and mixed wool of Morkaramans and their F1 crossbreds can be used for carpet and rug industry, and handmade textile in local facilities and wool of crossbreds might be suitable for fabric industry.

Key Words: Morkaraman , Kivircik , Chios , crossbred, wool characteristics

Introduction

Wool production from not correct domestic breeds is around 1,5-2,0 kg. The wool obtained from these animals is also rough and mixed in nature not suitable for textile industry. It can only be used in producing carpets, blankets and wool beds. In several studies conducted on domestic sheep in Turkey, dirty wool production was 1,6-3,7 kg, wool fineness was 23,4 - 37,6 μ , staple length was 7,8 - 24,3 cm (Aritürk *et al.*, 1960; Başpinar, 1985; Demir, 1989; Demir and Başpinar, 1992 and Özcan, 1973).

Wool is a suitable raw material for weaving by harboring certain features not found in other fibers such as fineness, length, tenacity, elasticity and Ondulation as well as keeping heat and moisture and having the ability to become matted, these are important features for fabric industry and harbor the wool with the ability to adjust body and environment relationships as a raw material (Sari, 1982).

Dirty wool production of Morkaraman , Chios and Kivircik sheep are 2 - 2,5 , 1,5 - 2 and 1,5 kg respectively ; staple lengths are 10 - 12 , 11 - 15 cm and 8 - 12 cm and fiber diameters are 30 – 34 , 28 - 34 and 30 -32 μ. The wool of all three species is rough and mixed in nature, the wool of Morkaraman is used in weaving carpets and rugs, in small handicrafts and for certain local needs, (Akçapinar, 1994; Yalçin and Müftüoğlu, 1962) , wool of Chios and Kivircik for manufacturing carpets and fabrics (Akçapinar, 1994).

In a research conducted on wool production characteristics of Chios and Imroz sheep, wool production of Sakiz sheep was 1,95 kg in general, having staple length of 12,40 cm and fiber diameter of 28,26 μ , corresponding features of İmroz sheep were measured as 2,61 kg, 22,93 cm and 32,30 μ respectively (Çörekçi and Evrim, 2000).

Wool production of Chios sheep was reported as 1,891 kg, staple length as 12,286 - 13,542 cm, fiber length as 9,560 - 11,521 cm and fiber diameter as 32,465 - 33,362 μ (Aritürk *et al.*, 1960).

Dirty wool production of Morkaraman, Merinos and (F1 and F2) crossbreds are reported as; 1.79, 2.86 kg and (3.13 and 2.74 kg) respectively (Ozsoy, 1980). Dirty wool production of Morkaramans bred in Altindere farms is reported to be 1.27 kg (Müftüoğlu, 1974).

Wool production by Kivircik sheep is between 1,5-4 kg staple length between 7,81-11,37 cm, wool fineness between 28,38-30,44 u Özcan, 1970). Under semi-intensive conditions, the reported dirty wool production, staple length and fiber diameters for Kivircik sheep were 1,67 kg, 8,74 cm and 29,3 μ respectively (Demir and Başpinar, 1992).

In a study investigating wool production characteristics of major sheep species in Turkey (Başpinar, 1985), dirty wool production, fiber diameter and staple length of Akkaraman sheep were 1,50 kg, 27,76μ and 8,08 cm respectively, when these parameters were measured in Chios, the results were 1,49 kg , 28,10 μ and 9,00 cm, for Avasi they were 2,25 kg , 29,39 μ and 11,87 cm , in Morkaraman 1,62 kg , 33,70 μ and 12,45 cm and finally measurements for Kivircik were reported as 1,28 kg, 31,82μ and 8,75 cm.

Dirty wool production of Morkaraman, Merinos and their crossbreds are reported as 1,06, 1,60 and 1,59 kg; they have respective staple lengths of 10,0, 6,9 and 8,4 cm, fiber diameters of 29,1, 23,5 and 25,9; tenacity and elasticity values of 15,9 g and 29,1%, 9,0 g and 28,9%, 10,7 g and 26,1% (Yalçin and Müftüoğlu, 1962).

This study was carried out in order to compare rte wool production characteristics of Morkaraman, Chios x Morkaraman (F1) and Kivircik x Morkaraman (F1) crossbreds. The aim was to demonstrate the possible changes that might occur in the wool characteristics of the Morkaraman sheep after cross-breeding.

Material and Method

The study group consisted of 25 Morkaraman , Chios x Akkaraman (F1) and Kivircik x Morkaraman (F1) female cross-breeds, at first shearing (1 ¼) time.

Shearing of the animals was performed with a machine in mid-June. Wool samples were obtained from there different parts of the body (shoulder, ribs and thigh) in same amounts and were mixed to have a single sample. The obtained samples were weighing 10 g on average. During the shearing, the weighing of dirty wool was performed with a scale having a sensitivity of 50 g. Attention was paid to obtain samples from animals having same livestock weight at the beginning of shearing. The samples obtained from each animal were assigned a number and were analyzed with the methods as reported by Imeryüz and Sandikçioğlu 1968. In the laboratory, important wool features such as fiber length and diameter, elasticity and tenacity were measured. For the measurement of fineness, 100 fibers were

measured from each sample and the mean was calculated. For measuring the length normal length method was employed, the measurement was conducted without eliminating the ondulations found on the fiber. For the measurement of staple length, elasticity and tenacity values, 10 random staples were obtained from each sample they were measured and means were calculated.
For the statistical analysis, in order to identify the difference between the groups variance analysis was used, the differences between the groups were compared with Duncan test (Düzgüneº, 1993). Statistical analyses were conducted with SPSS 10 program.

Results and Discussion

Mean wool production, staple length, fiber diameter, tenacity and elasticity values of Morkaraman, Kivircik x Morkaraman (F1) and Chios x Morkaraman (F1) crossbreds are demonstrated on Table 1.
Dirty wool production values of Morkaraman, Chios x Morkaraman (F1) and Kivircik x Morkaraman (F1) genotypes were 2,200 , 1,160 and 1,370 kg respectively (P<0.001) ; staple length values 15,525 , 10,517 and 11,955 cm (P<0.001) ; fiber diameter values 36,716 , 33,170 and 31,897 μ (P<0.01) ; tenacity values 15,029 , 9,528 and 10,333 g (P<0.001) and elasticity values 34,858% , 30, 789% and 33,184% (P<0.01) (Table 1).
When all the characteristics analyzed were considered, Morkaramans were superior to both crossbreds. Only the difference between the tenacity values of pure Morkaramans and Kivircik x Morkaraman (F1) crossbreds was not statistically significant. Concerning the differences between the two groups of crossbreds, only the difference between the elasticity values turned out to be of statistical significance (P<0.01).
In this study dirty wool production levels of different genotypes as Morkaraman, Chios x Morkaraman (F1) and Kivircik x Morkaraman (F1) were measured as 2,200 , 1,160 and 1,370 kg (P<0.001) respectively. Mean dirty wool production value of Morkaramans measured in this study was similar to 2-2.5 kg value reported by Demir, 1989; Özcan, 1970; Akçapinar, 1994, was higher than 1.5 kg and 1.7 kg values reported by Başpinar, 1985 and Ozsoy, 1980 and lower than 3.13 and 2.74 kg values reported by Ozsoy, 1980; for Morkaraman x Merinos F1 and F2 crossbreds. Values measured for crossbred genotype groups were lower than those of 1.6-3.7 kg dirty wool production values reported for domestic sheep (Aritürk *et al.*, 1960; Başpinar, 1985; Demir, 1989; Çörekçi and Evrim, 2000).

Table 1: Wool production characteristics of Morkaraman , Chios x Morkaraman (F1) and Kivircik x Morkaraman (F1) Crossbreds (n=25)

	Genotip						
	Morkaraman		SakizxMorkaraman (F1)		KivircikxMorkaraman (F1)		
Parameters	x	Sx	x	Sx	x	Sx	P
Dirty wool prod.(kg)	2,200 a	0,061	1,160 b	0,092	1,370 b	0,085	**
Staple length (cm)	15,525 a	1,696	10,517 b	2,002	11,955 b	2,392	**
Tenacity (g)	15,029 a	2,390	9,528 b	3,072	10,333 b	3,933	**
Elongation(%)	34,858 a	0,562	30,789 b	1,045	31,897 b	0,801	*
Fiber diameter (μ)	36,716 a	0,928	33,170 b	0,890	33,184 a	0,557	*

*Diffrences between the means of the groups * (P<0.01), ** (P<0.001) are important.
a, b, ab : Differences between the groups on the same line bearing different letters are important.

Staple length values of 15,525 , 10,517 and 11,955 cm (P<0.001) found in the study were longer than 10.0, 12.45 and 10-12 cm values for Morkaramans reported by Yalçin and Müftüoğlu, 1962; Başpinar, 1985; and Akçapinar, 1994 respectively; longer than 8.75 cm value reported for Kivircik by Başpinar, 1985 and similar to 8-12 cm reported for Kivircik by Akçapinar, 1994.
The identified fiber values for the groups were as follows; 36,716 , 33,170 and 31,897 μ (P<0.01); these values were higher than those reported Başpinar, 1985 for Morkaraman, Chios and Kivircik as 27.76, 28.10 and 31.82 μ respectively, as well as being higher than those reported by Çörekçi and Evrim, 2000 for Chios x Imroz crossbreds as 28.26 μ, they were found to be similar to those staple lengths reported by Akçapinar, 1994 for Morkaraman, Chios and Kivircik as 30-34, 28-34 and 30-32 μ.
Tenacity values of 15,029, 9,528 and10,333 g (P<0.001) that were obtained in the study were similar to those reported by Yalçin and Müftüoğlu, 1962.
The elasticity values measured for these three genotypes included in the study were 34.858%, 30.789% and 33.184% (P<0.01), being in correlation with the values reported by other authors (Yalçin and Müftüoğlu, 1962).
In conclusion, wool production, staple lengths, fiber diameters and finally tenacity and elasticity values of crossbreds were lower than those of pure Morkaraman, crossbreds were only different from each other when evaluated for elasticity values. We arrived at the conclusion that with this type of crossbreeding, the wool of Morkaraman sheep being the most dominant breed for Turkey while having rough type of wool production characteristics can be used for weaving carpets and rugs and simple handicrafts and for the provision of certain local needs, the wool of crossbred genotypes can be used for carpet and textile industry.

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