

Araştırma Makalesi/Research Article (Original Paper)

Live Weight After Shearing and Greasy Fleece Weight of Norduz Ewes in Different Breeding Conditions

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Abstract: In this study, the live weight after shearing, the greasy wool weight and, the clean fleece percentage of Norduz ewes in different breeding conditions were investigated. The animal material consisted of a total of 260 head of Norduz ewes including 52 head ewes at the different flocks raised in Dolaylı (farm 1), Geçerli (farm 2), Geziyurt (farm 3), Oğuldami (farm 4) and, Taşınacak (farm 5) neighbourhoods of Gürpınar province in Van city. Norduz ewes were sheared using shearing scissors between end of June and beginning of July. After shearing, ewes were weighted by using electronic digital weighing scale. Then, the sampling for clean fleece percentage were performed from area of the last rib on the right shoulder of 12 head of ewes in each flock. When all the farms were generally evaluated, the effect of live weight after shearing on the greasy wool weight was statistically significant ($p<0.01$). Least squares means for greasy wool weight at farm 1, farm 2, farm 3, farm 4 and, farm 5 were 2.03, 2.05, 2.05, 2.06 and, 2.06 kg, respectively. When all the farms were generally evaluated, the effect of age of ewe and farm on the live weight after shearing was statistically significant ($p<0.01$) in Norduz ewes. Least squares means for live weight after shearing at Dolaylı, Geçerli, Geziyurt, Oğuldami and, Taşınacak neighbourhoods were 53.21, 54.30, 51.25, 55.08 and, 54.93 kg, respectively. Means of clean fleece percentage were 64.25%, 67.76%, 63.50%, 66.68% and, 64.06% for Dolaylı, Geçerli, Geziyurt, Oğuldami and, Taşınacak neighbourhoods, respectively.

Keywords: Clean fleece percentage, Ewe, Greasy fleece yield, Live weight, Norduz, Shearing

Farklı Yetiştirici Koşullarında Norduz Koyunlarının Kırkım Sonu Canlı Ağırlığı ve Kirli Yapağı Verimi

Özet: Bu çalışmada, farklı yetiştirici koşullarındaki Norduz koyunlarının kırkım sonu canlı ağırlığı, kirli yapağı verimi ve randıman özelliği incelenmiştir. Hayvan materyalini, Van ili Gürpınar ilçesine bağlı Dolaylı (işletme 1), Geçerli (işletme 2), Geziyurt (işletme 3), Oğuldami (işletme 4) ve Taşınacak (işletme 5) mahallelerinde yetiştirilen farklı Norduz koyun sürülerinden 52'şer baş, toplam 260 baş koyun oluşturmuştur. Norduz koyunlarında kırkım işlemi, Haziran ayı sonu ile Temmuz ayı başında kırkım makası kullanılarak yapılmıştır. Koyunlarda kırkım sonu canlı ağırlığı elektronik dijital baskül ile tartılarak belirlenmiştir. Daha sonra, randıman tayini için analize yetecek miktarda ve örnek alma tekniğine uygun bir şekilde her sürüden 12'şer baş koyunun sağ omuz son kaburga bölgesinden yapağı numunesi alınmıştır. Tüm işletmeler genel olarak değerlendirildiğinde, Norduz koyunlarında kirli yapağı verimi üzerine kırkım sonu canlı ağırlığın etkisi istatistik olarak önemli ($p<0.01$) bulunmuştur. Dolaylı, Geçerli, Geziyurt, Oğuldami ve Taşınacak mahallelerinde yetiştirilen Norduz koyunlarının kirli yapağı verimine ilişkin En-Küçük Kareler ortalamaları sırasıyla 2.03, 2.05, 2.05, 2.06 ve 2.06 kg olarak bulunmuştur. Norduz koyunlarında kırkım sonu canlı ağırlığı üzerine yaş ve işletmenin etkisi, tüm işletmeler genel olarak değerlendirildiğinde, önemli ($p<0.01$) bulunmuştur. Norduz koyunlarında ortalama kırkım sonu canlı ağırlığı Dolaylı, Geçerli, Geziyurt, Oğuldami ve Taşınacak mahallelerinde sırasıyla; 53.21, 54.30, 51.25, 55.08 ve 54.93 kg bulunmuştur. Dolaylı, Geçerli, Geziyurt, Oğuldami ve Taşınacak mahallelerindeki işletmelerde yapağı randıman ortalamaları sırasıyla; % 64.25, 67.76, 63.50, 66.68 ve 64.06 bulunmuştur.

Anahtar kelimeler: Canlı ağırlık, Kırkım, Kirli yapağı verimi, Koyun, Norduz, Yapağı randımanı

Introduction

The most of sheep production in Turkey are carried out in extensive or semi-intensive systems. Van city in located at East Anatolia region of Turkey is important for sheep production. The most of sheep breeds reared in Turkey are characterized as rough-mixed wool genotypes and their wools are usually used to carpet, blanket, quilt and weaving socks. Turkey has an important place in the production of fleece with carpet type in the world. However, the wool industry and production in Turkey have not developed and fluctuations of the wool prices negatively affected the wool of production. Recently, there is an increase for sheep production in Turkey and use of rough-mixed wool in the world (DAKA 2012, Bingöl and Bingöl 2015).

In Turkey, also, the fine wool should be reduced in the textile industry and, the coarse wool should be mostly used increasing fleece yield (Çivi 1999, Alkan 2008). Wool is the most important raw material of the textile industry. Wool is a valuable woven material that shows superior clothing physiology such as protection from cold, good heat holding, high humidity take-up, low wetting capability and, felting ability (Kara Uzun 2008). The wool is still able to compete with many artificial fibers due to its unique properties. Also, along with the effect of environmental awareness spreading rapidly in the world, the demand for organic products in the textile sector has gradually increased and, the use of natural fibers instead of synthetic fibers has widespread (Karaboyacı and Uğur 2010).

Most of the native sheep breeds in Turkey have low meat and wool yields. The fat tailed Norduz sheep is favorably characterized by their adaptation to harsh environmental and feeding conditions. Norduz sheep is a variety of Akkaraman sheep breed (Aygün et al. 2003). This research was carried out in order to determine the live weight after shearing, the greasy fleece yield and, the clean fleece percentage in Norduz ewes under different breeding conditions.

Materials and Methods

The animal material consisted of a total of 260 head of Norduz ewes including 52 head ewes in different flocks bred in the farms of Dolaylı (farm 1), Geçerli (farm 2), Geziyurt (farm 3), Oğuldami (farm 4) and, Taşınacak (farm 5) neighbourhoods of Gürpınar province in Van province, Turkey. Norduz ewes were sheared using shearing scissors at the end of June and beginning of July. After shearing ewes were weighted by using electronic digital weighing scale. Fleeces were weighted and sampled for analyses. The sampling were performed from area of the last rib on the right shoulder of 12 head of ewes in each flock according to the sampling technique. Then analysis of clean fleece percentage was performed in the laboratory of Department of Animal Science, Agricultural Faculty at Yüzüncü Yıl University.

The mathematical model included fixed effects due to farm and age and random effect due to residual error. The effect of farm and age on the live weight after shearing and the greasy fleece yield was analyzed. The significance of fixed effects for farm and age was tested on live weight after shearing by using the SAS GLM procedure (SAS 2006).

The following model was used statistically to analyze the live weight after shearing of the ewes:

$$Y_{ijk} = \mu + a_i + b_j + e_{ijk}$$

The following model was used statistically to analyze the fleece yield characteristics of the ewes:

$$Y_{ijk} = \mu + a_i + b_j + b_1(X_{ijk} - \bar{X}) + e_{ijk}$$

Where is;

Y_{ijk} : The live weight after shearing and the greasy fleece yield associated to k. ewe with i. farm and j. age,

μ : Expected mean value,

a_i : i. farm effect,

b_j : The effect of j. age (2, 3, 4, 5)

b_1 : The regression effect of the live weight after shearing on the greasy fleece yield

X_{ijk} : Live weight associated to k. ewe with i farm and with j age,

\bar{X} : Average value of greasy fleece yield,

e_{ijk} : The random residual error.

Results and Discussion

The greasy fleece yield, the live weight after shearing, and the clean fleece percentage of Norduz ewes

Least squares means of the greasy wool weight, the live weight after shearing and, the clean fleece percentage of Norduz ewes are presented in the Table 1.

As seen from Table 1, the effect of shearing age and the farms on the greasy fleece weight was not significant ($p>0.05$) but the effect of live weight after shearing on the greasy fleece weight was significant ($p<0.01$) when all the farms were generally evaluated in Norduz ewes.

When all the farms were generally evaluated, least-squares mean for greasy wool weight of Norduz ewes was 2.05 ± 0.04 kg. The means of greasy fleece weight of ewes with two, three, four and five years of age were 2.06 ± 0.02 , 2.06 ± 0.01 , 2.04 ± 0.01 and, 2.04 ± 0.01 kg, respectively. Least-squares means for greasy fleece weight of Norduz ewes bred in Dolaylı, Geçerli, Geziyurt, Oğuldami and Taşınacak neighbourhoods were 2.03, 2.05, 2.05, 2.06 and, 2.06 kg, respectively (Table 1).

Table 1. Least squares means for the greasy fleece weight, the live weight after shearing, and the fleece yield value of Norduz ewes

| Factors | n | Greasy Fleece Weight (kg) | Live Weight After Shearing (kg) | Fleece Yield Value (%) |
|----------------------------|-----|---------------------------|---------------------------------|------------------------|
| <i>General</i> | 260 | 2.05 ± 0.004 | 53.76 ± 0.13 | 65.25 ± 0.20 (n=60) |
| <i>Age</i> | | | ** | |
| 2 | 21 | 2.06 ± 0.02 | 47.23 ± 0.47^d | -- |
| 3 | 108 | 2.06 ± 0.01 | 52.29 ± 0.21^c | -- |
| 4 | 87 | 2.04 ± 0.01 | 55.44 ± 0.23^b | -- |
| 5 | 44 | 2.04 ± 0.01 | 57.14 ± 0.32^a | -- |
| <i>Farms</i> | | | ** | (n= 12) |
| Dolaylı | 52 | 2.03 ± 0.01 | 53.21 ± 0.25^b | 64.25 ± 0.44 |
| Geçerli | 52 | 2.05 ± 0.01 | 54.30 ± 0.24^a | 67.76 ± 0.39 |
| Geziyurt | 52 | 2.05 ± 0.01 | 51.25 ± 0.36^c | 63.50 ± 0.54 |
| Oğuldami | 52 | 2.06 ± 0.01 | 55.08 ± 0.29^a | 66.68 ± 0.51 |
| Taşınacak | 52 | 2.06 ± 0.01 | 54.93 ± 0.30^a | 64.06 ± 0.36 |
| <i>Regression (Linear)</i> | | | | |
| -Live weight (kg) | | $0.041\pm 0.002^{**}$ | -- | -- |

** : $p<0.01$; a, b, c, d: Values in same column not having a common superscript differ significantly ($p<0.05$).

When it was reviewed the literature studies on the greasy wool production of Norduz sheep, the average values of 2.91 kg reported by Yılmaz and Denk (2004) and 2.22 kg reported by Tuncer (2008) were found higher than average greasy fleece weight of 2.05 kg detected in Norduz sheep in all farms. But, the average greasy fleece weight of 1.96 kg reported by Karakuş et al. (2005) for Norduz ewes was lower than the average greasy fleece weight of 2.05 kg determined in all farms.

The effect of the shearing age and the farm on the live weight after shearing in all the farms was statistically significant ($p<0.01$) when all the farms were generally evaluated.

For Norduz ewes, average of live weight after shearing in all the farms was found as 53.76 ± 0.13 kg. The means of live weights in Norduz ewes were 47.23 ± 0.47 kg in 2 years old ewes, 52.29 ± 0.21 kg in 3 years old, 55.44 ± 0.23 kg in 4 years old and 57.14 ± 0.32 kg in years old. As a result of Duncan' multiple test, the highest average of the live weight after shearing was found in ewes with 5 years old. The live weights of the Norduz ewes in Dolaylı, Geçerli, Geziyurt, Oğuldami and, Taşınacak farm were found as 53.21 ± 0.25 , 54.30 ± 0.24 , 51.25 ± 0.36 , 55.08 ± 0.29 and, 54.93 ± 0.30 kg, respectively. According to this data, the highest live weight after shearing was in Oğuldami farm.

Average of live weight after shearing of 53.76 kg found in Norduz ewes in all the farms is similar to 52.85 kg reported for Awassi ewes (Elibol 2004). If other findings from the literature are considered together with

the results of this research, it can be said that there is a significant relationship between the live weight after shearing and the age of ewe (Yılmaz 2003, Elibol 2004, Altıoğlu 2007, Üstüner 2007, Sönmez et al. 2009, Hakan 2013).

Average fleece yield value of Norduz ewes in all farms was found as 65.25%. In the study conducted, the highest mean of fleece yield value was found in Geçerli farm (67.76%) while the lowest mean in the Geziyurt farm (63.50%). This difference may be due to the maintenance, the feeding and the breeder conditions between the farms. In addition, the fleece yield values in Dolaylı and Taşınacak neighborhoods are close to each other.

Kara Uzun (2008) reported that the averages of fleece yield value in the races of Çine Çaparı, İmroz, İvesi, Karayaka, Kıvrıkcık, Karacabey Merino, Sakız, Menemen, Karakaş, Norduz and, Tahirova were 60.62, 59.46, 70.81, 68.57, 66.91, 51.91, 65.26, 62.90, 61.41, 66.08 and, 66.44%, respectively. Yılmaz and Denk (2004) found that the average yield of fleece in Norduz ewes was 68.25%. This average is higher than the average we found. Tuncer (2008) and Karakuş et al. (2005) identified that the average yield of fleece in Norduz ewes was 60 and 55.76%. These averages were lower than the average in this study.

Compared to native sheep breeds in Turkey, it was seen that average greasy fleece yield of Norduz sheep was similar to some breeds, higher than some breeds and, lower than some ones. In this study, greasy fleece yield of Norduz sheep was found to be lower than that of Dağlıç and Hamdani breeds but to be higher than that of Kıvrıkcık and Sakız breeds. The yield of fleece in Norduz sheep was found to be lower than the crossbred genotypes reported in the literature in Turkey. The reasons for this difference between sheep breeds for fleece yield in Turkey may be:

- The genotypic level observed in the herd,
- Shelter conditions,
- Structure of the farms,
- Climate features,
- Disease and internal-external parasites,
- Region where fleece samples from animal were taken
- Level of knowledge on management and
- Planning of research and researcher factor.

It has been thought that wool yield will be obtained much higher than sheep if the factors listed above which reduce the greasy fleece yield and the fleece yield value of sheep are improved.

When compared to native sheep breeds in Turkey, it was understood that average the live weight after shearing of Norduz sheep was similar to some sheep breeds, higher than some breeds and, lower than some ones. In this study, for example, the live weight after shearing of Norduz ewes was found to be lower than that of Kangal genotype but to be higher than that of Akkaraman breed. This difference may be due to the maintenance and the feeding and, the diversity in breeding conditions.

The average of fleece yield value obtained in the study is similar to those reported for other literatures on Norduz sheep. The difference between fleece yield values can be explained by the diversity of conditions in farms. The fleece yield value is also influenced by shelter and pasture conditions as well as breed characteristics. In addition, it can be said that it is also affected from materials such as the greas, the moisture, the fertilizer, the plant materials, the dust and, the soil. The fleece yield values may especially arise depending on the environmental conditions of animals.

Conclusion

When the fleece yield of Norduz ewes was compared with other the domestic genotypes reported in the literature, it was close to that of the Norduz sheep. It is concluded that the fleece yield varies depending on many external factors such as maintenance, nutrition, business structure, reproductive activity, soil type, climate, disease and parasites. Especially, the differences in the yield value of wool due to the environmental conditions may occur.

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