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Short communication

Reproductive performance and milk traits of F1 Romanov ewes

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ABSTRACT

The objective of this study was to evaluate the effect of crossbreeding Awassi and Morkaraman ewes with Romanov sires on litter size and total productivity as reflected by reproductive performance and milk production in the ewes. Twenty-three Romanov × Awassi (RA) and 19 Romanov × Morkaraman (RM) ewes were used. All of the ewes were pregnant at the start of the study, and litter size at birth and at weaning (60 days) were recorded. Milk production was recorded weekly and milk composition was estimated as dry matter and fat percentage. Litter size at birth (RM: 1.89 ± 0.18; RA: 1.62 ± 0.15) and weaning (RM: 1.67 ± 0.20; RA: 1.46 ± 0.17), dam weight at lambing (RM: 50.2 ± 2.37; RA: 44.2 ± 1.98) and total productivity (RM: 29.9 ± 3.05; RA: 24.4 ± 2.54) were not influenced by breed-type. Lactation length and milk yield was relatively but not significantly higher in RA than RM ewes. Dry matter and fat percentage of milk were found to be similar for both breed-types. Results of the present study indicate that crossbreeding of Awassi and Morkaraman ewes with Romanov rams yielded similar performance in F1 ewes. When F1 ewe performance is compared with their pure breed maternal ancestor, it is concluded that reproductive performance is improved by crossbreeding with Romanov.

1. Introduction

The Morkaraman is a predominant dual purpose, fat-tailed sheep breed of the eastern region of Turkey and its population is 22% of the total sheep population in the area. The age at first lambing in Morkaraman sheep is around 24 months and they produce about 1.05 lambs per ewe and 40–60 kg of milk per 150-day lactation under semi intensive conditions. The Awassi is a fat-tailed breed reared extensively in southern Turkey and it is estimated that there are about one million Awassi sheep in Turkey. The Awassi is known for its hardiness and adaptability to the local environment and, in the case of the Improved Awassi, also for its high milk production. Yet, prolificacy of the Awassi is low at about 1.2 lambs born per ewe lambing (Ocak et al., 2009). As lamb production is an important source of income in all flocks, increasing the fecundity of the Awassi has always been an important breeding goal (Gootwine, 1995). Romanov is one the best known short-tailed sheep being introduced into several countries in the world where their genetic material has been utilized through crossbreeding with local sheep. This has resulted in the production of some new synthetic breeds (Dyrmundsson and Niznikowski, 2010). Awassi and Morkaraman sheep with low prolificacy were used for crossbreeding with prolific Romanov breeds to increase reproductive performance to meet the increasing nutritional demands of the growing human population (Koycegiz et al., 2009). Thus, the objective of this study was to evaluate the effect of crossbreeding Awassi and Morkaraman ewes with Romanov rams on reproductive performance and milk production of the F1 ewes. This report also includes a comparison of production

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Table 1
Reproductive performance (mean ± S.E.) of Romanov × Morkaraman (RM; $n = 19$) and Romanov × Awassi (RA; $n = 23$) ewes, NS: $p > 0.05$.

Traits	Genotype	
	RM	RA
Dam weight at lambing (kg)	50.2 ± 2.37	44.2 ± 1.98
Postpartum onset estrus (days)	135.6 ± 7.15	159.1 ± 8.55
Litter size at birth	1.89 ± 0.18	1.62 ± 0.15
Litter size at weaning	1.67 ± 0.20	1.46 ± 0.17
Total productivity (kg)	29.9 ± 3.05	24.4 ± 2.54

Table 2
Milk traits and composition (mean ± S.E.) of Romanov × Morkaraman (RM; $n = 17$) and Romanov × Awassi (RA; $n = 17$) ewes, NS: $p > 0.05$.

Traits	Genotype	
	RM	RA
Lactation length (days)	102.3 ± 23.07	157.2 ± 23.07
Milk yield (kg)	74.2 ± 11.00	104.3 ± 11.00
Dry matter (%)	16.6 ± 1.12	17.0 ± 1.12
Fat (%)	6.3 ± 0.85	7.5 ± 0.85

traits of F1 ewes with dam breeds based on previous studies.

2. Materials and methods

The experiment was conducted at the Research and Application Farm of the College of Agriculture, Atatürk University, Erzurum (39°55′N, 41°17′E and 1820 m above sea level). A total 42 ewes were used, ages 1–3 years, and were either Romanov × Morkaraman ($n = 19$; RM) or Romanov × Awassi ($n = 23$, RA). Ewes used in this study were pregnant via natural mating with rams of the same breed and ages of ewes in each genotype groups were homogeneous. No hormone treatments were used. Upon lambing, ewes and their offspring were placed in a large pen and after weaning at 60 days of age the lambs were separated from their dams. The reproductive traits evaluated were those measured from the start of lambing to the next breeding season, which occurred at 6 months following parturition. Litter size at birth and weaning and onset estrus after parturition were recorded. Total productivity for ewe was calculated at the end of 8 week weights for dam reared lambs. After weaning dams were separated and checked for onset of estrus with vasectomized rams twice daily.

Milk production was recorded weekly starting from 4 weeks following parturition. The lambs were separated from their dams overnight, 12 h prior to milking. Ewes were hand milked the following morning and the quantity of milk produced was recorded. Milk production was then extrapolated over the 24-h period (Fadel et al., 1989). In the estimation of lactation milk yield the Holland method (Cilek and Sahin, 2009) was used and milk composition (crude fat and dry matter) were determined on each sample. Ewes were sampled weekly until the milk sample obtained was less than 100 ml.

The parameters for the reproductive traits measured were dam weight at parturition, litter size at birth and weaning, and onset of estrus in dams following parturition. Milk traits were as lactation length, lactation milk yield, dry matter and crude fat. Data were analyzed by least squares analysis of variance by ANOVA using the GLM procedure (Minitab, 1998) to examine the effect of crossbred genotype on the given parameters.

3. Results and discussion

Dam weights at lambing were found to be similar between the two genotypes. Litter size at birth and weaning and, total productivity of dams did not differ for the breed-type. Onset of estrus following parturition showed a similar pattern (Table 1). Crossbreeding with Romanov to increase prolificy has been practiced in many countries and synthetic breeds have been developed. In Spain, the Salz breed was developed by crossing Romanov rams (Fahmy, 1996) and litter size was increased from 1.40 to 1.87 while lambing interval was decreased from 255 days to 228 days (Maria and Ascaso, 1999). In our current study, litter size of Awassi and Morkaraman F1 crosses ewes were found as 1.62 and1.89, respectively. In the current study the litter size of F1 ewes was higher than those recorded for their maternal ancestors (Awassi: 1.14 and Morkaraman: 1.11) in our previous research (Emsen and Yaprak, 2006). Onset of estrus following lambing was reported as 183 days for Awassi and 184 days for Morkaraman by Kutluca et al. (2006). Postpartum onset of estrus was decreased by crossbreeding with Romanov and occurred 24 and 49 days earlier in RA and RM ewes, respectively.

Lactation length was relatively longer ($p > 0.05$) in RA ewes and produced slightly higher milk than RM ewes. Dry matter and crude fat of milk were similar in both breed-types (Table 2). Borys and Osikowski (1998) used Romanov for crossbreeding with Polish Merino to estimate the efficiency of the dairy and meat production of the ewes resulting from crossbreeding. They reported that compared with Merino, Romanov crossbreeds had the best results for dairy and meat production. Boylan (1998) studied different breeds raised in the U.S. to evaluate their potential for commercial milk production and reported that Romanov ewes produce 44 kg milk with 7.1% fat and 18.6% dry matter. Milk yield and lactation length were reported as 82 kg and 143 days for Morkaraman and, 138 kg and 169 days for Awassi ewes by Macit and Aksoy (1996). Milk yield and lactation length did not differ in RM ewes compared to pure Morkaraman but crossbreeding Awassi with Romanov seemed to lower the milk production. In order to produce a very high quality sheep milk cheese, the milk needs to be high in butterfat (6–8%) and generally, the higher the production the less fat there is in the milk. Milk fat percentages were found higher in RA and RM ewes than those reported for Awassi (6.24%) and Morkaraman (5.66%) ewes raised at the same farm (Macit and Aksoy, 1996).

4. Conclusion

It was concluded that crossbreeding Awassi and Morkaraman sheep with Romanov increased total reproductive performance. F1 ewes showed good production potential in a system requiring improved prolificacy or accelerated lambing schedules. The productivity of the RM and RA F1 ewes was similar to those observed for other F1 ewes produced in different countries. Results observed for RM and RA ewes confirm previous findings with use of the Romanov breed in other countries and indicate that crossing with low prolificacy, hardy native breeds can result in a substantial increase in productivity.

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