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SEXUAL BEHAVIOR OF WHITE KARAMAN, RED KARAMAN AND AWASSI RAMS EXPOSED TO FAT-TAILED ESTROUS EWES

ABSTRACT

This study was conducted to evaluate the sexual performance of White Karaman, Red Karaman and Awassi rams. Eight rams each of White Karaman, Red Karaman and Awassi breed were subjected to sexual performance tests by being individually exposed to two estrous ewes during four periods, each lasting 30-min. Bouts of leg kicking and anogenital sniffing were similar among breed groups. Mounting frequency was greater (P<0.05) in Awassi than in White Karaman and Red Karaman rams. Tail-raising was greater (P<0.05) and mating frequency tended to be greater (P<0.01) in White Karaman than in Awassi and Red Karaman rams. The number of mounts per tail-raising (efficiency) was influenced by breed group and test day (P<0.05). White Karaman rams maintained the best efficiency throughout the trial. Efficiency in Awassi and Red Karaman rams improved with each test day. Results of the present study indicated that White Karaman was more capable of mating with fat-tailed ewes than the Red Karaman and Awassi rams.

Keywords: Ram, Sexual Behavior, Awassi, White Karaman, Red Karaman

YAĞLI KUYRUKLU ÖSTRUSTAKİ KOYUNLARLA BIR ARADA BULUNAN AKKARAMAN, MORKARAMAN VE İVESI KOÇLARINDA SEKSÜEL DAVRANIŞLAR

ÖZET

Bu çalışma Akkaraman, Morkaraman ve İvesi koçlarının seksüel davranışlarını değerlendirmek amacıyla yapılmıştır. İki östrus süresi arasında bulunan ve herbiri 30 dakika süren koyunlarla bir arada bulunan Akkaraman, Morkaraman ve İvesi koçlarının seksüel performans testleri yapılmıştır. Ayak vurma ve anogenital koklama değerleri ırklar arasında benzer bulunmuştur. Atlama davranış İvesi ırkında Akkaraman ve Morkaraman ırklarından daha yüksek oranda (P<0.05) saptanmıştır. Kuyruk kaldırma oranı Akkarman ırkında, İvesi ve Morkaraman ırklarına göre daha yüksek değere (P<0.05) sahipken, çiftleşme frekansı oranı Akkaraman ırkında, İvesi ve Morkaraman ırklarına göre yüksek (P<0.01) bulunmuştur. Her bir kuyruk kaldırmadaki aşım (atlama) sayısı üzerine test günü ve ırk grupları etkili olmuştur (P<0.05). Çalışma süresince Akkaraman koçları en iyi performansı sağlamıştır. Elde edilen sonuçlara göre Akkaraman koçlarının, Morkaraman ve İves ırkına kıyasla yağlı kuyruklu koyunlarla çiftleşmeye en uygun ırk olduğu bulunmuştur.

Anahtar Kelimeler: Koç, Seksüel Davranış, İvesi, Akkaraman, Morkaraman

1. INTRODUCTION (GİRİŞ)

Animal agriculture is depending upon animal reproduction and reproduction is depending upon willingness and ability of animals to engage in sexual behaviour even where artificial insemination is employed. To meet particular management needs, humans take advantage of knowledge of sexual behaviour by facilitating or preventing its occurrence. An additional reason for studying in farm animals arises from an interest in understanding evolutionary and ecological influences on expression of behaviour. Sexual performance of rams is highly variable. Most mature rams readily court, mount, and mate estrual ewes, whereas the intensity of sexual behavior varies from asexuality to high sexual activity [1 and 2]. The inability of young rams to mate when first introduced to cycling females may be a problem to many sheep breeders who prefer to use rams by the time they reach 18 months of age [3].

Katz et al. [4] reported that about 30% of 10-month old rams were sexually inactive during their first exposure to estrous females. Sexual performance tests have been used as a tool to predict ram performance in pasture mating [5].

White Karaman is a fat-tailed and white coloured sheep species with rough-mixed wool which produces 60 kg/day milk in 140-160 days of lactation period and has 20-30% twin rate. Red Karaman is a fat-tailed and brown-purple coloured sheep species with rough-mixed wool, which produces 80-90 kg/day milk in 150-160 days of lactation period and has 20-30% twin rate.

Awassi is a fat-tailed and white coloured (with the exception of head and feet being brown) sheep species with rough-mixed wool, which produces 120-160 kg/day milk in 170-200 days of lactation period and has 10-20% twin rate. This species is bred in Turkey, Arabic countries and North Africa [6].

2. RESEARCH SIGNIFICANCE (ÇALIŞMANIN ÖNEMİ)

This study is designed to test the sexual performances of White Karaman Awassi and Red Karaman breeds rams to exposure to fat tailed ewes. And also to determined the differences of sexual behaviour between different breeds.

3. MATERIAL AND METHODS (MALZEME VE YÖNTEM)

The experiment was conducted during the late summer to mid-autumn (early September to mid- November) at the Firat University Veterinary farm. The animals were kept in an open-front barn having free access to water and ad libitum feeding. The natural breeding season occurs during September through December for those breeds. Sexually native, 18-month-old rams of three different breed groups were used in this study. Eight rams each of White Karaman, Red Karaman or Awassi rams were subjected to sexual performance tests. Each ram was individually exposed to two estrous ewes (fat-tailed) during four 30-min periods, each two days apart. Body weight and scrotal circumference were recorded every two weeks for two months before sexual performance was evaluated.

Scrotal circumference was measured using a flexible tape at the widest scrotal diameter. Twenty four ewes (18 months of age) were synchronized to exhibit oestrus on four occasions each two days apart. Eight ewes were used on each occasion. Vaginal progestagen sponges containing 40 mg fluorogestone acetate were inserted for 14 days and 600 IU of eCG (PMSG, Sanofi, France) were administered intramuscularly at the

time of sponge removal. Only four of the eight ewes were used on each test day. Estrous ewes were identified by rams.

Sexual performance tests were conducted between 08:00 and 12:00. Four estrous ewes were placed in two 6 m × 6 m pens. A third similar pen, where the observers stood, separated the two test pens. Ewes were kept unrestrained in the pens. Each ram was evaluated individually by exposing it to the two estrous ewes for 30 min on each test day.

Rams were selected randomly for testing whereby each pen was used to test rams of all breed groups on each test day. Observations were recorded for each ram throughout the 30-min period. Recorded behavioural parameters [7, 8 and 9] included bouts of leg kicking, anogenital sniffing, mounts, frequency of raising the fat tail of ewes, and mating (mounts with ejaculation) frequency. Data were analyzed by analysis of variance for a completely randomized design. All analyses were conducted using the General Linear Model procedure of SAS [10].

4. RESULTS (SONUÇ)

Sexual performance parameters are presented in Table 1. The pre-copulatory sexual behaviour (leg kicking and anogenital sniffing) was similar among breed groups. Awassi rams had greater ($P<0.05$) mounting frequency than either White Karaman or Red Karaman rams. White Karaman rams, however, had greater ($P<0.05$) tail-raising frequency and a tendency ($P<0.01$) to have greater mating rate than Awassi and Red Karaman rams. Aggressive behaviour towards females was observed. A moderate correlation ($r=0.38$) was detected between pre-copulatory sexual behaviour and mating rate ($P<0.05$). Mounting efficiency improved ($P<0.05$) with each test day, especially in Red Karaman and Awassi rams. On the first test day, mounting efficiency was 3.7±0.8, 3.9±1.2 and 2.13±1.1 mounts/tail-raising in White Karaman, Awassi and Red Karaman rams, respectively.

This efficiency improved by the last test day to reach 3.7±2.0, 9.1±2.2 and 6.3±2.2 mounts/ tail-raising in White Karaman, Awassi and Red Karaman rams, respectively.

Table 1. Value of scrotal circumference and sexual performance (means±standard error) of White Karaman, Red Karaman and Awassi rams. (Tablo 1. Akkaraman, Morkaraman ve İvesi koçlarına ait seksüel performans (ortalama±standart hata)ve skrotum çevresi değerleri)

	Ram Breed		
Sexual performance[1]	White Karaman breed(n=8)	Red Karaman breed(n=8)	Awassi breed (n=8)
Scrotal circumference (cm)	29.4^{c}±0.2	33.4^{a}±0.2	32.7^{b}±0.2
Leg kicking (no./30 min)	12.3±2.1	10.7±2.0	16.5±2.1
Anogenital sniffing (no./30min)	11.6±1.3	12.3±1.4	14.5±1.2
Mounts (no./30 min)	16.5^{b}±2.5	15.3^{b}±2.5	22.8^{a}±2.5
Tail raising (no./30 min)	5.3^{a}±0.5	3.0^{b}±0.5	0.9^{b}±0.4
Mating (no./30 min)	0.6^{c}±0.1	0.3^{d}±0.1	0.3^{d}±0.1
Mounts/tail-raising (first test day)	5.6±0.8	4.14±1.2	5.82±1.2
Mounts/ tail-raising (last test day)	5.8±2.0	8.3±2.2	10.1±2.2

[1]Sexual performance testing was performed on 4 test days (30 min per ram per day).
[ab] Means within the same row with different superscript letters differ significantly (P<0.05).
[cd] Means within the same row with different superscript letters differ at (P<0.01).

5. DISCUSSION (TARTIŞMA)

Scrotal circumferences differed significantly among the three breed groups, being greatest in Red Karaman rams and lowest in White Karaman rams, while Awassi rams were intermediate. Scrotal circumference is known to differ among breeds of sheep [11]. It is also influenced by nutrition [12] and body growth [13]. Scrotal circumference is a good index of sperm production in the ram [14].

Mating behaviour includes the desire to libido and the ability to copulation, both of which are under genetic influence [15]. Many factors affect sex drive and sexual performance, including season of year, genetics, breed differences, hormonal influence, post weaning management, temperature and nutrition [16]. In the present study, the frequency of pre-copulatory sexual behaviour was similar among breed groups. The frequency of anogenital sniffing was similar, while the frequency of leg kicking was lower than in previous reports [17]. Pre-copulatory behaviour was moderately correlated with mating. Pre-copulatory behaviour in rams reflects their underlying sexual motivation [18]. This means that the higher the frequency of pre-copulatory behaviour, the greater the frequency of other sexual activities examples mounting and mating. Mounting frequency was greater in Awassi than in Red Karaman and White Karaman rams while tail-raising and mating frequencies were greater in White Karaman than in Awassi and Red Karaman rams. This contradiction may be related to differences in ram age between the studies and to the greater mating rate observed in the present study in favour of White Karaman rams. Unexperienced rams have lower mating efficiency than experienced rams [19], while rams allowed to mate with ewes have lower mounting frequency than rams prevented from copulating [18]. The lower copulation in Awassi and Red Karaman rams probably resulted in the aggressive behaviour females in response to frustrated sex drive. A

similar incidence of aggression was reported by Price and colleagues [20] when rams were prevented from copulating by covering the perineal area of females. Mating efficiency was better in White Karaman than in Awassi and Red Karaman rams throughout the four test days.

Efficiency improved in Awassi and Red Karaman rams with each exposure to females but it still remained lower than in White Karaman rams. The great improvement in Awassi and Red Karaman rams efficiency with subsequent test days is explained by the poor performance observed during the initial exposures.

The results of this study indicate that White Karaman rams managed to raise the fat tail of females more frequently suggests a greater advantage in natural mating over Awassi and Red Karaman rams.

REFERENCES (KAYNAKLAR)

1. Terrill, C.E., (1937). Measurement of reproductive capacity as an aid in selection of rams of high fertility. Pages 311–331 in Proc. 30th Annual Meeting American Social Animal Production, Chicago, IL.
2. Price, E.O., (1987). Male sexual behaviour. Veterinary Clinical North American Food Animal Practice, 3, pp:405–42
3. Al-Nakib, F.M.S., Lodge, G.A., and Owen, J.B., (1986). A study of sexual development in ram lambs. Animal Production, 43, pp: 459–468
4. Katz, L.S., Price, E.O., Wallach, S.J.R., and Zenchak, J.J., (1988). Sexualperformance of rams reared with or without females after weaning. Journal of Animal Science, 66, pp: 1166–1173
5. Kilgour, R.J., (1993). The relationship between ram breeding capacity and flock fertility. Theriogenology, 40, pp: 277–285
6. Akcapinar, H., (2000). Sheep Breeding. Second ed. pp:87-116. Ankara, Turkey.
7. Kridli, R.T. and Said, S.I., (1999). Libido testing and the effect of exposing sexually naive Awassi rams to estrous ewes on sexual performance. Small Ruminant Research, 32, pp: 149–152.
8. Kridli, R.T. and Al-yacoub, A.N., (2006). Sexual performance of Awassi ram lambs reared in different sex composition groups. Applied Animal Behaviour Science, 96, pp: 261–267.
9. Kridli, R.T., Abdullah, A.Y., and Momani Shaker, M., (2006). Sexual performance and reproductive characteristics of young adult Awassi, Charollais-Awassi and Romanov-Awassi rams. Sheep Goat Research Journal, 21, pp: 12–16.
10. SAS, (1997). SAS User's Guide: Statistics, Version 6, (SAS Institute Inc., Cary, NC).
11. Belibasaki, S. and Kouimtzis, S., (2000). Sexual activity and body and testis growth in prepubertal ram lambs of Friesland, Chios, Karagouniki and Serres dairy sheep in Greece. Small Ruminant Research, 37, pp: 109-113.
12. Fourie, P.J., Schwalbach, L.M., Neser, F.W.C., and Van Der Westhuızen, C., (2004). Scrotal, testicular and semen characteristics of young Dorper rams managed under intensive and extensive conditions. Small Ruminant Research, 54, pp: 53–59.
13. Tulley, D. and Burfening, P.J., (1983). Libido and scrotal circumference of rams as affected by season of the year and altered photoperiod. Theriogenology, 20: 418–435.

14. Toe, F., Rege, J.E., Mukasa-Mugerwa, E., Tembely, S., Anindo, D., Baker, R.L., and Lahlou-Kassi, A., (2000). Reproductive characteristics of Ethiopian highland sheep. I. Genetic parameters of testicular measurements in ram lambs and relationship with age at puberty in ewe lambs. Small Ruminant Research, 36, pp: 227–240.
15. Bearden, H.J. and Fuquay, J.W., (1997). Applied Animal Reproduction, 4th ed, Prentice-Hall, Upper Saddle River, NJ.
16. Mickelsen, W.D., Paisley, L.G., and Dahmen, J.J., (1982). The relationship of libido and serving capacity test scores in rams on conception rate and lambing percentage in the ewe. Theriogenology, 18, pp: 79–82.
17. Godfrey, R.W., Collins, J.R., and Gray, M.L., (1998). Evaluation of sexual behaviour of hair sheep rams in a tropical environment. Journal of Animal Science, 76, pp: 714–717.
18. Price, E.O., Erhard, H., Borgwardt, R., and Dally, M.R., (1992). Measures of libido and their relation to serving capacity in the ram. Journal of Animal Science, 70, pp: 3376–3380.
19. Price, E.O., Estep, D.Q., Wallach, S.J.R., and Dally, M.R., (1991). Sexual performance of rams as determined by maturation and sexual experience. Journal of Animal Science, 69, pp: 1047–1052.
20. Price, E.O., Erhard, H., Borgwardt, R., and Dally, M.R., (1993). Effect of ewe restraint on libido and serving capacity of rams. Applied Animal Behaviour Science, 35, pp: 339–345.