

Potential for Early Breeding of Kivircik (Western Thrace) Ewes

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Abstract

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This study was carried out to investigate the possibility of early breeding ewe lambs of Kivircik sheep breed. Mating and reproduction performances were investigated in normally mated (15-16 months old) and early mated (7 months old) females.

The average live weights determined before mating were 39.69 and 41.60 kg and after lambing 47.95 and 46.90 kg respectively in early and normally mated ewes. The rates of pregnancy, lambing, infertility, single birth, twinning, death, survival up to weaning, the number of lambs born per ewe lambing and the number of the weaning lambs per ewe lambed were found as 78.33 and 94.33 %, 78.33 and 94.33 %, 21.67 and 5.67 %, 91.49 and 89.00 %, 8.51 and 20.00 %, 9.80 and 3.12 %, 90.20 and 96.88 %, 1.09 and 1.20, 0.98 and 1.16 respectively in early and normally mated ewes.

The difference between the characteristics investigated except death rate and survival rate were found significant ($P < 0.01$).

Key words: sheep; Kivircik; early breeding; live weight; reproduction characters

Introduction

Sheep productivity is the most important criteria for the evaluation of total profitability in sheep enterprises. High productivity is achieved through the optimization of reproduction of ewes, as well as survival and growth of lambs.

Natural and economical conditions,

agricultural characteristics, pasture areas and traditions which are made suitable condition for to generalize of sheep breeding in Turkey. The main native sheep breed of Thrace and Marmara region is Kivircik. It has thin tail and short ears, producing meat, wool and milk. Kivircik ewe live weights are 35-40 kg; rams weight 45-50 kg (Kaymakci and Sönmez, 1996).

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The vegetation at pastures in the Middle and East Anatolia regions of Turkey is weak and low quality because of the harsh weather conditions. However, in the Western parts of Turkey, Marmara and Aegean regions are more suitable for semi-intensive sheep breeding as the weather at the regions is milder and pasture quality is better.

In the Western parts of Turkey, especially in Thrace, sheep milk is mostly used for making a special kind of white cheese which is very popular in Turkey. Most of the lambs are weaned as early as at one and a half months of age, so that ewes can be milked longer and the majority of the lambs are slaughtered without further fattening. In this way, meat production potential of these lambs is poorly utilized. The quality of Kivircik meat is considered to be the best among local and imported breeds as it has a good marbling. Besides Turkey, Kivircik sheep breed is also bred in Bulgaria and Greece especially at Western Thrace parts and is called as Thraki sheep (Yalcin, 1986).

The age of the ewe may influence her response to flushing as yearlings appear to respond to a lesser extent than mature ewes and flushing appears to have no clear effect in ewe lambs (Dymundsson, 1973).

The time of the year at which lambs are born is particularly influential on the age of puberty for lambs of both fast and slow growing breeds. Ewe lambs born early in the lambing season tend to reach puberty at 5 months of age and also reach sexual maturity at a younger age than lambs born late in the lambing season. Lambs born late in the lambing season will reach puberty and display estrous cycles during the breeding season of the following year, when they are 12 to 16 months age (Pineda, 1989).

In different studies carried out to show the reproduction and production performance of Kivircik sheep in Turkey, oestrus rate was 91.0-99.3 %, conception rate was 74.4-89.9 %, birth rate was 74.6-95.7 %, twinning rate was 24.1-41.3 %, litter size was 1.04-1.48, survival rates at weaning was 89.3- 99.2 %, survival rates at 180 day was 84.8-98.6 %, milk yields per lactation was 56.0-82.9 kg and lactation length was 135.3-191.0 days and weight before mating was 52.9 kg (Sonmez and Kizilay, 1972 ; Ozcan and Aki, 1974 ; Sonmez et al., 1976 ; Sonmez et al., 1991 ; Altinel et al., 1994 ; Altinel et al., 2000). In addition lamb growth was inspected, birth weight, weight at weaning, weight at 180 days of lambs and adult live weight of ewes were found 3.5-4.3 kg, 18.2-27.1 kg, 23.2-37.5 kg and 38.3- 52.7 kg respectively (Sönmez et al., 1976 ; Evrim et al., 1992 ; Altinel et al., 1994 ; Altinel et al., 2000).

This paper reports mating and reproduction performances of normally (15-16 months old) and early mated (7 months old) females Kivircik sheep.

Material and Method

Animals and mating program

The study was conducted at the Agricultural Faculty Research Farm of Uludag University in Bursa province. This farm is located in the humid lowland tropics, at an altitude of 100 m above sea level and at a longitude 29° E and latitude 40° N (average minimum temperature 9.0 °C, average maximum temperature 20.2 °C, annual rainfall 713.1 mm).

The genotype involved was Kivircik bred. At the beginning of the study there was a total of 113 ewes different age (7 months and 15-16 months). The first group was mated nearly 15-16 months of age and

the other was mated nearly 7 months of age. These gave birth between 1999 June and 2000 February. Ewes were exposed to fertile rams during 30 day mating seasons in September. Rams were added to the flock for natural matings. For this practice 8 Kivircik rams were used.

Ewes and their lambs were monitored until each ewe had weaned lambs. Data from a total of 97 lambings and 115 lambs were included in the analysis.

Management and feeding

Ewes and suckling lambs were allowed to natural grass hay ad libitum and mineral licks during the day from 08:00 h to 17: 00 h and were housed at night. Animals had access to water, both on pasture and in the night pens. Ewes also grazed the pasture covered *Vicia sativa*, *Vicia pannonica*, *Medicago sativa* and *Onobrychis sativa* mixtures. Ewes were managed in mixed groups and treated identically. Before and after mating, last period of gestation and after birth ewes received concentrate supplement (200-400 g/head/day) consisting of 75 % wheat, 23 % sunflower oil cake, 1.4 % limestone, 0.5 % salt and 0.1 % premix. Lambs were separated into sex groups at weaning, at an average age of 2 months, but male and female groups were exposed to the same grazing paddocks in a rotational grazing system until the end of the experiment at the age of 12 months. Before weaning, lambs had only access to the feed available to dams. Following weaning, lambs were offered 50-100 g / head / day of the concentrate until they were able to graze actively and during the peak dry season. Animals were routinely drenched against flukes and roundworms and vaccinated for pasteurellosis and clostridia infections.

Data collection and analysis

Each animal was individually identified. Records included live weights after mating and lambing, the rates of pregnancy, lambing, infertile, single birth, twinning, death, survival up to weaning, the number of lambs born per ewe lambing and the number of the weaning lambs per ewe lambing.

To find difference between the groups in z- and t- test methods were used (Duzgunes et al., 1983).

Results

Live weight of lamb ewes, yearlings and lambs

Live weights determined before mating were 39.69 and 41.60 kg and after lambing 47.95 and 46.90 kg respectively in early and yearling mated ewes. Mean birth weights were 3.79 and 3.84 kg and weaning weights were 20.22 and 23.20 kg ($P<0.01$) respectively in lambs of early and yearling mated ewes (Table 1).

Table 1 Live weights of ewe lambs and yearling ewes that were mated and of lambs at birth and weaning

Fertility traits

To increase intensity of selection and to get more saleable breeding animals, a high fertility lambings are needed. Fertility performance can be taken in to consideration by three criteria. These are, rate of ewes which gave birth, number of lambs born from every 100 ewes and survival rates of lambs until weaning. Results of fertility traits of lamb ewe and yearling are presented in Table 2.

In this study, 60 lamb ewe and 53 yearling were mated. 78.33 % of lamb ewe and 94.33 % of yearling ewe were preg-

Table 1
Live weights of ewe lambs and yearling ewes that were mated
and of lambs at birth and weaning

| Characters | Ewe lambs | | Yearling | |
|-------------------------|-----------|--------------------|----------|--------------------|
| | n | Mean \pm SE, kg | n | Mean \pm SE, kg |
| Premating weight | 60.00 | 39.69 \pm 0.714 | 53.00 | 41.60 \pm 0.276 |
| Postlambing weight | 47.00 | 47.95 \pm 0.783 | 50.00 | 46.90 \pm 0.214 |
| Birth weight of lambs | 51.00 | 3.79 \pm 0.115 | 64.00 | 3.84 \pm 0.163 |
| Weaning weight of lambs | 46.00 | 20.00 \pm 0.632a | 62.00 | 23.20 \pm 0.291b |

a,b : Line mean values with different superscripts are significantly different, $P < 0.01$

Table 2
Fertility of lamb and yearling ewes and performance of lambs

| Characters | Ewe lambs | | Yearling | |
|---|---------------|----------|----------------------|----------|
| | Number (head) | Ratio, % | Number of ewe (head) | Ratio, % |
| Ewes present at mating | 60 | | 53 | |
| Ewes pregnant | 47 | 78.33a | 50 | 94.33b |
| Ewes gave birth | 47 | 78.33a | 50 | 94.33b |
| Single | 43 | 91.49a | 40 | 80.00b |
| Twins | 4 | 8.51a | 10 | 20.00b |
| Ewes infertile | 13 | 21.67a | 3 | 5.67b |
| Lambs at birth | 51 | | 60 | |
| Lambs at death | 5 | | 2 | |
| Lambs at weaning | 46 | | 58 | |
| Survival up to weaning | | 90.2 | | 96.67 |
| Death up to weaning | | 9.8 | | 3.33 |
| The number of lambs born per ewe lambing | 1.09a | | 1.20b | |
| The number of the weaning lambs per ewe lambing | 0.98a | | 1.16b | |

a,b : Line mean values with different superscripts are significantly different, $P < 0.01$

nant and gave birth ($P < 0.01$). There was no abortion in the flock. 91.49 % and 8.51 % of lamb ewe; 80.00 % and 20.00 % of

yearling gave birth to single and twins respectively ($P < 0.01$).

Survival rates of lambs at weaning for

yearlings was found (96.67 %) higher than ewe lambs (90.20 %) but these differences were found statistically non-significant. The number of lambs born per ewe lambing and the number of the weaning lambs per ewe lambing were found 1.09, 1.20, 0.98 and 1.16 respectively in early and normally mated ewes ($P < 0.01$).

Discussion

The little difference between pre-mating live weight of the two groups probably arises from the intensive feeding of lambs from birth up to mating time. Lambing rate and reproduction performance depend on live weight in ewes (Christenson et al., 1976). Birth weight of lambs are found in this study similar to the results of the studies reported by (Sönmez et al., 1976, Evrim et al., 1992, Demir, 1995). The work on ewe lambs relating to puberty and early reproductive performance states that, nutrition during the early life of the female may have a profound influence on its subsequent reproductive performance. Poor nutrition during the juvenile phase, that is up to the first oestrus, particularly if severe and of long duration can lead to long term persistent effects on adult reproductive performance. In ewe lambs there is a close relationship between ovarian weight and body weight (Dymundsson, 1973) and that lambs fed at a high level prior to puberty have larger reproductive tracts in relation to body size and have more multiple ovulations than poorly fed animals (Lamming, 1971).

Sexual maturity or the onset of puberty is reached considerably before the attainment of adult mature size and can occur at 40-80 per cent of adult weight. There are undoubtedly breed and even strain differences which determine the age when

puberty is attained. However, nutrition is also of considerable significance since, in general, faster growth during rearing will favour an earlier onset of oestrus. Behavioural signs of oestrus in ewe lambs is usually weak and the first oestrus in the breeding season tend to be later than in adults. The conception rate of ewe lambs is extremely variable and 80 per cent lambing can be considered good (Fraser and Stamp, 1987).

In this study, the ratio of pregnant, birth and litter size in the ewe lambs were lower than yearling ($P < 0.01$). The conception and birth rates for yearling ewes achieved in this study were similar to some earlier findings in Kivircik ewes (Sönmez et al., 1976; Demir and Baspinar, 1992; Koyuncu et al., 2001); however, were higher the results of the other local sheep breeds (Müftüoğlu, 1974; Yalçın and Aktas, 1976; Güney and Özcan, 1983; Baspinar, 1985). Although the litter size of the two age groups were found statistically significant ($P < 0.01$) results of this study were lower than the other results given references (Baspinar, 1985; Demir and Baspinar, 1992; Altinel et al., 1994).

Survival rates of lambs at weaning of yearling ewes were found higher than ewe lambs ($P < 0.01$). This difference result from mainly lower milk yield of ewe lambs for offspring and lower mothering ability. Survival rates at the age of weaning of lambs were determined to be similar given in references (Sönmez et al., 1991; Demir and Baspinar, 1992; Koyuncu et al., 2001). Lamb survival was much more strongly affected by lamb genotype than by dam genotype. This is in agreement with inferences from behavioural observations on the same flock in which genetic differences were observed in lamb behaviours, but not maternal behaviours, associated with lamb

survival (Dwyer et al., 2000). Although the mothering ability of ewe lambs may be comparable with adult ewes, there is a tendency for high perinatal mortality in their offspring. This may be partly attributable to litters having low birthweights and to an increased incidence of dystokias (Fraser and Stamp, 1987).

The number of lambs born per ewe lambing and the number of the weaning lambs per ewe lambing were found to be different and the difference was statistically significant ($P < 0.01$). This result, lamb ewes which have concerned Colbred, Border Leicester and Taeswater breeds were changed between 1.03 and 1.50 (Bowman, 1966).

Conclusion

Ewe lambs reach puberty by 6 to 7 months of age, but the age of puberty is greatly influenced by breed, nutritional and environmental factors. Ewe lambs from fast growing breeds such as Suffolk, Finnsheep and Hampshire tend to have an earlier onset of puberty than ewe lambs from slower growing breeds.

Breeding from ewe lambs is not detrimental to subsequent reproductive performance since any retardation in growth and development which may occur can be overcome, by 2-3 years of age, if nutritional requirements are satisfied.

The results determined in this study, it has been advised to mate at least some of the early born lambs at the meat season of the same year in which the lamb born. By so doing the overall reproductive performance could be increased and some economical advantages could be provided.

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