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Research Article

The Possibilities of Twice-Yearly Lambing of Awassi Sheep Ewes Without Using Hormones in an Organic Animal Production System

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Abstract: This goal of the present research was to determine the possibility of twice-yearly lambing in Awassi sheep. The research was appropriate in terms of ecological agriculture, animal breeding applications, and organic agricultural production with no impact on their health or behavior, or exposure to environmental conditions such as exogenous hormone applications. The research was carried out after the February 2001 lambing season. Rams were introduced to the ewe flock while the lambs were weaning. The sheep's giving birth in August 2001 indicated that they had become pregnant while the lambs were weaning. The fertility rate in the August 2001 birth season was much lower than that in the February 2001 fertility season. However, the February and August 2001 fertility rates together showed that the gestation rate increased 40% and approximately 40% to 44%, respectively, over a year.

Key Words: Awassi sheep, organic animal production, fertility traits, lambing.

İvesi Irkı Koyunlarda Organik Hayvancılık Sisteminde Hormon Uygulamaksızın Yılda İki Kez Doğum Olanakları

Özet: Bu araştırma İvesi ırkı koyunlarda, son yıllarda giderek önem kazanan organik, ekolojik tarım ve hayvancılık uygulamaları kapsamında organik tarım ilkelerine uygun, hayvanların dengesini, sağlığını ve davranışlarını etkilemeden hormon uygulamaksızın yılda iki kez doğum olanaklarının araştırılması yönünde yapılmıştır. Bu araştırmada Şubat 2001 kuzulamalarını takiben, kuzular sütten kesilmeyerek analarını emmeleri sağlanmış ve sürüye koç, kuzular analarını emerken katılmıştır. Sürüye koç katıldıktan sonra da kuzular analarını emmeye devam etmiştir. Ağustos 2001 tarihinde doğumların gerçekleşmesi, kuzuların analarını emdiği dönemde koyunların gebe kaldığını göstermektedir. Ağustos 2001 dönemindeki doğumlara ait döl verimi ölçütleri, Şubat 2001'e göre oldukça düşüktür. Fakat yine de Ağustos 2001 dönemi, Şubat 2001 dönemiyle beraber düşünüldüğünde bir yılda gebelik oranında % 40'lık, kuzu veriminde ise % 40-44 'lük artış söz konusudur. Şubat 2002 doğum mevsiminde ise Şubat 2001 doğum mevsimindeki oranlara yakın oranlar elde edilmiştir.

Anahtar Sözcükler: İvesi, koyun, organik hayvansal üretim, döl verim özellikleri, kuzulama.

Introduction

This research was conducted on Awassi sheep to determine the possibility of twice-yearly lambing. The research was suitable for ecological agriculture and animal breeding applications, organic agricultural production without affecting animal stress, health or behavior and without exogenous hormone applications (1).

The Awassi, a fat-tailed sheep, is a local breed in southeastern Turkey (2), Syria (3), Lebanon (4), Jordan (5), Iraq (6), Cyprus (7) and Israel (8). It has been introduced into many countries in Europe and Asia and Australia (9).

In the GAP (Southeastern Anatolian Project, GAP is the Turkish acronym) region of Turkey, breeding plays an important role in the effectiveness of livestock. Sheep meat is preferred to goat and cattle meat. The existing sheep breeds in this region also include native breeds like Akkaraman (70%-75%), Awassi (20%-25%), Karakaş and their hybrids (10).

The homeland and the range of the Awassi sheep are the Mesopotamia region located between the Fırat (the Euphrates) and the Dicle (the Tigris) rivers, and they are bred in Gaziantep, Hatay and especially Şanlıurfa provinces and often along the low and arid meadows of the Syria-Turkey border (2). Sheep are almost unable to

graze on meadowlands, especially during the very hot summer months.

The aims of livestock breeding are to get more progeny from an animal to obtain more than one birth within a year, to breed more progeny in a life span, to have high-quality and highly productive and uniform progeny, and to decrease the death rate. In order to achieve these aims, the reproduction span can be supervised using certain technological methods and newly developed hormones (11). With the aim of supervising reproduction, mating and insemination can be planned when ovulation chance and issue are desired to be increased, and in this way the rate of twinning can be increased as well. The ovary activities of polyestrus seasoning animals are stimulated in the anoestrus period, and therefore the chance of pregnancy can be created. Young stocks reach sexual maturity at an early age thus the obtaining of progeny can be studied.

The main aims of sheep breeding are both to increase the income from animal production and to get sheep to give birth twice a year. The more you increase sheep production, the more businesses increase their profits.

If the characteristics of meat and milk production are examined under insufficient care and feeding conditions, it is understood that Awassi sheep are important compared to other domestic sheep breeds. It is known that the mating season of Awassi sheep is 3 to 4 months in the fall (12,13). Mating season is at its highest level in August and November (12,13). Awassi sheep lamb once a year (3). However, it is known that Awassi sheep can be in estrous 2 seasons in a year. Especially in Şanlıurfa province some breeders suppose that Awassi sheep can lamb only in the fall. As a characteristic, Awassi sheep lamb twice a year, which is rare in other sheep breeds. Gestation periods of Awassi sheep are on average between 150.7 and 152 days (3,14,15); therefore, it is possible that they can lamb twice a year or 3 times in 2 years. If it is considered that their lambing period is twice a year, the sheep has to be pregnant within 4-6 weeks of the first lambing.

Under normal circumstances, after lambing if this method is used on sheep in lactation anoestrous and if a high quality is needed, the animals have to be in the dry period. In the anoestrous period, in order to have pregnant sheep, hormones have to be used (16,17).

Therefore, progestagen and melatonin, to increase ovulation and the gestation ratio, and PMSG and LH hormones have to be used. Generally in the anoestrous period, after the stimulation, gestation ratios are lower compared to the service season (16).

In the GAP region, Awassi sheep are commonly bred and so research on the possibilities of twice-yearly lambing of Awassi sheep was conducted in the sheep farming unit, Agriculture Faculty, Harran University.

Materials and Methods

Twenty-five ewes were chosen from the Ceylanpınar State Agriculture Administration, and taken to the sheep farming unit of Harran University's Faculty of Agriculture. In February 2001, the births were completed, and while the lambs were sucking their mothers, 2 rams were introduced to the flock to breed with the ewes one month after the births. In the meantime, suckling continued. Twenty-five ewes lambed after a 5-month gestation period, in August 2001; 2 lamb crops were collected in a year. They were utilized to determine the fertility rate. The calculations of the fertility rates are given as follows (18):

a) Gestation rate = Lambing ewes/Mating ewes x 100

b) Lamb yield = Born lambs/Lambing ewes x 100

c) Sterility Rate = Sterile ewes/Mating ewes x 100

e) Single births = Single births/Lambing ewes x 100

f) Twin births = Twin births/Lambing ewes x 100

A ratio comparison by z-test was conducted to calculate significance on the basis of examples derived from the comparison made between the gestation rates, lamb yields, sterility rate and single and twin birth rates of ewe groups to which rams were introduced once and twice a year, respectively (19).

In this experiment, different nutrition levels were not applied before or after pregnancy. The sheep were fed a normal level of nutrition.

Results

Generally, lactation keeps anestrus under its thumb but in some conditions the milking or suckling sheep were able to mate in this research. In the February 2001,

following the lambing period, rams mated with the ewes while the lambs were sucking their mothers. The birth of the ewes in August 2001 shows that while lambs continued to suck their mothers, ewes were gestated. Fertility rates for the February 2002 season were close to those for the February 2001 season.

We obtained 28 lambs (16 male and 12 female) from 25 ewes and they were used as the material of this research in February 2001. Twenty-two ewes gave birth to single lambs and 3 to twins. In August 2001, from the same 25 sheep, we obtained 11 lambs (6 male and 5 female). Nine ewes gave birth to single lambs and 1 to twins.

Fertility rates in the 2 periods are given in the Table. Fertility rates in August 2001 are lower than those in February 2001. Nevertheless, considering the February 2001 and August 2001 periods together, an increase of 40% can be seen in the pregnancy period.

The gestation, lambing, sterility, and single and twin birth rates of the ewe flocks to which rams were introduced once and twice a year are demonstrated in the Table. The gestation rates reached a total of 140% on an annual basis including 100% for births in February and 40% for those in August. Accordingly, the difference between the 2 flocks was considered significant ($P < 0.01$).

The lamb yield was calculated as 156% in total on an annual basis including 112% for births in August and 156% in total on an annual basis including 112% for births in August and 110% for those in February, and the difference between the total amount of annual births and the other groups was considered significant ($P < 0.01$). As for the sterility rate, it was calculated as 30% on an annual basis including 88% for the births in February and 60% for those in August and the difference between the groups was observed to be significant ($P < 0.01$).

When single and twin births were compared, the difference was found to be 124% annually including 88% for births in February and 90% for those in August, and likewise the difference between the groups was considered significant ($P < 0.01$).

Discussion

In this research, without any hormone applications, we observed an increase in fertility and twice-yearly lambing in Awassi sheep. This is important for the profitability of sheep farming.

In order to increase fertility in sheep, hormone applications are used. With this method, fertility can be increased 20%-50% (18). It is reported that the ovarian activities of sheep can be induced during seasonal anestrus by various hormone treatments to increase the lambing frequency and lambs per ewe (3,11,16,17).

This technique benefits from a synthetic progestin implant or melatonin to synchronize estrus along with pregnant mare's serum gonadotropin (PMSG) to stimulate ovarian activity and superovulations. However, conception rates can still vary widely, most likely due to variations in individual ovarian response to falling progestin levels and response to PMSG (20). Some riks

Table. Some fertility traits according to February 2001, August 2001 and total 2001 births

Fertility Traits		February 2001 Births	August 2001 Births	Total 2001 Births
Gestation Rate*	n	25/25	10/25	35/25
	%	100[a]	40[b]	140[c]
Lamb Yield *	n	28/25	11/10	39/25
	%	112[a]	110[a]	156[b]
Sterility Rate*	n	0/25	15/25	15/50
	%	0[a]	60[b]	30[c]
Single Births*	n	22/25	9/10	31/25
	%	88[a]	90[a]	124[b]
Twin Births*	n	3/25	1/10	4/25
	%	12[a]	10[a]	16[b]

* The differences among the different letters in the same column were significant ($P < 0.01$).

occur due to the use of PMSG. Production of antibodies against PMSG may result in ovarian dysfunction and overstimulation of follicular growth can result in multiple births in excess of lambs (20).

In addition, because this method needs teamwork and certain materials, its application field is limited. In raising sheep, additional feeding and hormones have increased birth numbers per unit time and lambing rate. However, additional cost should be covered by sheep yield; otherwise, if sheep or lamb meat does not provide enough income, the profitability of hormone application will be affected negatively.

It is known that the mating season of Awassi sheep is 3 to 4 months in the fall (3,13,14). There are differences between breeds in terms of mating seasons.

In Turkey sheep breeds showed differences in the period of mating season on average from 3.5 to 5 months (12,14). It was reported that the duration of the mating season is 104.7 days in Awassi sheep (3,12,14). An important distinction was seen in this research on Awassi sheep between pregnancy rates by providing breeding from the end of July to September. Awassi sheep that do not have lactation anestrus were the material of this research.

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