Effects of nutritional practices in different periods on some yield characteristics of Kilis goats

Kilis keçilerinde farklı dönemlerdeki besleme uygulamalarının bazı verim özellikleri üzerine etkileri

Mahmut KESKİN

Hatay Mustafa Kemal University, Faculty of Agriculture, Department of Animal Science, Antakya-Hatay, Turkey.

Aims: In this study, the effects of supplementary feeding during gestation and lactation period on birth and weaning weights of kids and milk yield of dams in Kilis goats were investigated.

Methods and Results: In the study, experimental goats were divided into three groups as control group, short-term feeding (STF) group and long-term feeding (LTF) group. The control group was kept under breeder’s management conditions. Supplementary feed of 750 g/head/day were given to the goats from the last 20 days of gestation to 90th days after birth in the STF group, and from last 40 days of gestation to the end of lactation in LTF group. At the end of the experiment, the highest lactation period was 220.2 days in the LTF group, followed by STF and control groups (P <0.05). Likewise, in the LTF and STF groups, the lactation milk yield, which was determined as 466.2 and 426.3 liters respectively, was higher than the control group (316.4 liters) (P <0.05).

Conclusions: It was concluded that supplementary feeding during gestation and lactation periods caused an increase in milk yield and lactation length of Kilis goats.

Significance and Impact of the Study: At the end of study, it can be stated that if supplementary feeding is made during gestation or lactation, milk yield characteristics of Kilis goats will be improved. Suckling period for the goats is the period when pasture conditions are good. For this reason, even in the goats managed only in the pasture, milk yield of mothers is sufficient for multiple born kids.

Keywords: Supplementary feeding, kid growth, milk.

INTRODUCTION

According to the Turkish Statistical Institute data, Hair goats constitutes approximately 98% of total goat population that are 10.9 million in Turkey (Anonymous, 2018). Although it is not included in the official statistics, it is stated by different researchers that there are approximately 500 thousand heads of Kilis goats in the country (Gül et al., 2016b; Keskin et al., 2017). Kilis goat, which is one of the native gene sources of Turkey is reared extensively in Kilis, Gaziantep, Hatay, Adana and Mersin provinces (Özcan, 1989; Keskin et al., 1996; Gül et al., 2016c; Keskin et al., 2017). Kilis goats, which have higher milk yield and litter size than Hair goats, have the advantages of being raised in hot and dry weather conditions, mountainous and rugged areas, and under extensive or semi-intensive conditions compared to breeds of European origin. Many studies have been conducted to determine and improve milk and fertility characteristics of Kilis goats (Keskin et al., 1996; Koşum et al., 2004; Kaymakçı, 2010; Gül et al., 2016b; Keskin et al., 2017).
According to our experience in the region where this goat is reared, Kilis goat breeding has been carried out depending on the natural conditions as in the Hair goats, with some minor differences. Some of these differences are feeding practices in different herds during the last periods of pregnancy and different periods of lactation and migration of some breeders to Cukurova region to feed their animals by evaluating the harvest residues in summer months due to the narrowing of the grazing areas in Kilis.

Many researchers have reported that feeding in late stages of pregnancy or during lactation period on milk yield and fertility in goats (Özcan, 1989; Kaya and Öztürkcan, 2005). As stated in these studies, supplementary feeding during these periods is important for better growth of the fetus, higher birth and weaning weights and more milk production in lactation. It is also known that the effect of feeding practice in the late stages of pregnancy appears more pronounced, especially in multiple pregnancies.

In this study, the effects of short and long-term supplementary feeding on the birth and weaning characteristics of the kids and milk yield characteristics of dams were investigated in Kilis goats reared under extensive conditions in Kilis province.

RESULTS and DISCUSSION

Different fertility characteristics of Kilis goats are given in Table 1. As seen in this table, litter sizes that was number of kids per number of goats joined by bucks for the control, STF and LTF groups were calculated as 132.0%, 144%, 164%, respectively. While the single birth rate was 54.5% in the control group, it was calculated as 48.0% and 33.3% in the LTF and STF groups, respectively. As average of all groups, birth rate, kid yield by mated goats, kid yield by goats giving birth, survival rate and multiple birth rate were detected as 90.7%, 146.7%, 161.8%, 91.8% and 54.4%, respectively. Feeding practices during the mating period may have effect on these properties. However, there was no statistical comparison between the groups since the different feeding practices to the groups were applied after the last 20th and 40th days of pregnancy in the current study.

The reproductive characteristics determined in the study were higher than the values reported by Keskin and Tüney (2015). On the other hand they were similar to the values reported by Keskin et al. (1996), Gül et al. (2016a,b) and Keskin et al. (2017) for the same breed. In the study, the effects of different feeding practices on birth and weaning weights of Kilis goats are given in Table 2. As seen in this table, birth and weaning weights were similar in control, STF and LTF groups. However, it was determined that sex of the kids affected birth and weaning weight. Male kids were heavier than female kids at both birth and weaning (P < 0.05). It was also determined that the birth weights of triplets were lower than twins and singles (P < 0.05). The average birth and weaning weights of the kids were calculated as 4.4 ± 0.06 kg and 12.7 ± 0.23 kg, respectively.
Table 1. Some reproductive traits of experimental goats (%)

| Traits                                | STF    | LTF    | Control | Total |
|----------------------------------------|--------|--------|---------|-------|
| Kidding rate                           | 84.0   | 100.0  | 88.0    | 90.7  |
| Kid yield by mated goats               | 144.0  | 164.0  | 132.0   | 146.7 |
| Kid yield by goats giving birth        | 171.4  | 164.0  | 150.0   | 161.8 |
| Survival rate                          | 97.2   | 90.2   | 87.9    | 91.8  |
| Single birth rate                      | 33.3   | 48.0   | 54.5    | 45.6  |
| Twin birth rate                        | 61.9   | 40.0   | 40.9    | 47.1  |
| Triple birth rate                      | 4.8    | 12.0   | 4.6     | 7.3   |

Different feeding practices had no effect on the birth and weaning weights of the kids (Table 2). This may be due to the fact that the number of single-born kids in the control group is higher than the other two groups, even by chance. However, the fact that the birth weight was lower in triplets showed that the nutrients given to the dams fed during gestation were insufficient for three fetuses to gain enough live weight. Similar effect of birth type on birth weight in Kilis goat was also reported by Keskin et al. (1996). It was also seen in the same table that this effect of birth type on the kids’ body weight disappears during the weaning period. This is due to the fact that the milk yield of Kilis goats is sufficient to raise the multiple born kids, even in the control group (Table 3). The period when the milk yield rises after birth and peak coincides with the months when the pasture conditions are good due to the rains in the region. Therefore, even if the breeders do not feed additionally, goats’ milk production is sufficient for the growth of the kids. For this reason, the important effect of birth type on birth weight disappeared during the weaning period since multiple born kids in all groups were fed well during the period of suckling. This situation is compatible with the effect of gender on birth and weaning weight, as stated by many researchers (Al-Shaikh and Mogawer, 2001; Kaya and Öztürkcan, 2005; Keskin et al., 2017; Nugroho et al., 2018).

Table 2. Birth and weaning weight (kg) of the kids (x±s.e.)

| Feeding application groups | Birth weight | Weaning weight |
|----------------------------|--------------|----------------|
|                            | STF (n=36)   | LTF (n=41)     | Control (n=33) | Total (n=100) |
| Birth type                 |              |                |                |               |
| Single                     | 4.4±0.14a    | 12.6±0.49a     |               |               |
| (n=31)                     |              | (n=24)         |                |               |
| Twin                       | 4.4±0.08a    | 12.9±0.30      |               |               |
| (n=64)                     |              | (n=62)         |                |               |
| Triplet                    | 3.9±0.15b    | 12.4±0.57      |               |               |
| (n=15)                     |              | (n=14)         |                |               |
| P                          | <0.05        | >0.05          |                |               |
| Total                      | 4.4±0.06     | 12.7±0.23      |               |               |
| (n=110)                    |              | (n=100)        |                |               |

P, statistical significance; a, b, c, different superscripts in same column indicate statistically different groups.
As can be seen from Table 3, the highest lactation length was calculated for the LTF group with 220.2 days, followed by STF and control groups ($P < 0.05$). Similarly, the lactation milk yields, which were determined as 466.2 for LTF group and 426.3 liters for STF group were higher than the control group (316.4 liters; $P < 0.05$). In other words, both lactation length and lactation milk yield were affected by additional feeding. These results regarding the lactation characteristics were in agreement with the reports of Kaya and Öztürkcan (2005) which indicated that feeding had a positive effect on lactation time and lactation milk yield. In addition, the milk yield characteristics obtained in the current study were compatible with the reports of different researchers (Gül ve ark., 2016b; Keskin ve ark., 2017).

### CONCLUSIONS

In this study carried out with Kilis goats to investigate the effect of supplementary feeding on the growth of kids and some lactation traits, it was concluded that (a) supplementary feeding practices during the last 20 or 40 days of gestation did not affect on the birth weight, (b) both sex and birth type affected birth weight, (c) the effect of birth type disappeared in the weaning because the milk yield of the dams was sufficient for the growth of the kids, (d) supplementary feeding during the first 90 days or whole lactation increased lactation length and milk yield.

### REFERENCES

Al-Shaikh MA, Mogawer HH (2001) Factors affecting body weight of Aardi goat kids in Saudi Arabia. J. Appl. Anim. Res. 20: 233-238.
Anonymous (2018) TUİK, Turkey Statistical Institute, Animal Production Statistics. Retrieved December 25, 2019, from http://www.tuik.gov.tr/UstMenu.do?metod=temelis t
Gül S, Keskin M, Daşkıran İ, Gündüz Z (2016a) Applicability of different synchronization protocols during breeding season in Kilis goats. Greener J. Agric. Sci. 6 (6): 203-208.
Gül S, Keskin M, Göçmez Z, Gündüz Z (2016b) Effects of supplemental Feeding on performance of Kilis goat on pasture condition. Ital. J. Anim. Sci. 15 (1): 110-115.
Gül S, Keskin M, Gündüz Z (2016c). Türkiye’de yetiştiriciliği yapılan keçiler. Tarım Türk Dergisi 59: 64-70.
Kaya Ş, Öztürkcan O (2005) Meraya ek olarak verilen kesif yemin Hatay keçilerinde anannın performansına döl ve süt verimine etkileri. Süt Keçiciliği Ulusal Kongresi, Mayıs 20-28, İzmir.
Kaymakçı M (2010) Goat breeding. In: Native breeds (Editor: Ozder M), İzmir: Meta Press. pp. 17–40.
Keskin M, Kaya Ş, Özcan L, Biçer O (1996) Hatay bölgesinde yetiştirilen keçilerin bazı morfolojik ve fizyolojik özellikleri üzerine bir araştırma. MKÜ Zir. Fak. Derg. 1 (1): 69-84.
Keskin M (2000) Hatay bölgesinde yoğun yetiştirme koşullarında Şam (Damascus) keçilerinin morfolojik özellikleri ve performanslarının saptanması. Doktora Tezi. MKÜ Fen Bil. Ens., Zootekni ABD, 108 s.
Keskin M, Tüney D (2015) Kilis keçilerinde vücut kondisyon puanı ve döl verimi arasındaki ilişki. MKÜ Zir. Fak. Derg. 20 (2): 60-65.
Keskin M, Gül S, Biçer O, Daşkıran İ (2017) Some reproductive, lactation, and kid growth characteristics of Kilis goats under semiintensive conditions. Turk J. Vet. Anim. Sci. 41: 248-254.
Kosum N, Taskın T, Akbas Y, Kaymakçı M (2004) Heritability estimates of birth and weaning weights in Saanen, Bornova and Saanen x Kilis goats. Pakistan J. Biol. Sci. 7:1963–1966.
Nugroho T, Nurhidayati A, Ayuningtyas Al, Kustiyani C, Prastowo S, Widyas N (2018) Birth and weaning weight of kids from different Boer goat crosses. IOP Conference Series: Earth and Environmental Science 142: 1-4.
Özcan L (1989) Küçükbaş Hayvan Yetiştirme I (Keçi Üretimi). Ç.Ü. Ziraat Fakültesi Ders Kitabı No: 111, 318s.