

Original Research Article

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Estrus Synchronisation in Sirohi Goats Using Short Term Avikesisl-S[®] with Prostaglandin

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ABSTRACT

The objective of the present study was to evaluate efficacy of indigenously prepared intravaginal progestagen sponges impregnated with 350 mg of natural progesterone (Avikesil-S[®]) kept for seven days and prostaglandin at sponge removal Sirohi goats. Percentage of does in estrus was 100 percent. Mean interval from end of treatment and onset of estrus (37.44 ± 3.92 hr), duration of estrus (22.80 ± 2.15 hr) were recorded while estrus induced goats were allowed to bred naturally with sexually active males. Upon pregnancy diagnosis using ultrasonogram on 35 days post mating 70.00 per cent of the animals were pregnant which had followed upto parturition. Further, all pregnant does delivered after gestation period of 149.14 ± 1.26 days. Mean litter size, Single birth, sex ratio (male:female) and birth weight of kids were 1.00 ± 0.00 , 100.00 per cent (7/7), 28.57:71.43 per cent and 3.08 ± 0.13 kg, respectively. Avikesil-S[®] intravaginal for seven days along with Cloprostenol injection on day of sponge removal proved efficient for estrus synchronisation in Jamnapari goats.

Keywords

Sirohi, Goat, Estrus synchronization, Avikesil-S[®]

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Introduction

Sirohi is one of the most popular dual purpose goat breeds of the north-western arid and semi-arid regions of India with acceptable prolificacy. This has proved to be an excellent goat breed with respect to disease resistance, adaptability to dry or hot climate, growth and production performance under poor quality

range conditions (Tomar *et al.*, 1998). Trend of rearing Sirohi goats is catching among the farmers from southern region of Karnataka. Only a few studies of estrous synchronization have been reported in Sirohi goats (Sharma and Purohit, 2009; Inwati, 2016; Shakya, 2017). Sharma and Purohit (2009) had studied effectiveness of the self-prepared 300 mg progesterone intravaginal sponges for 18 days

in estrus induction. Inwati (2016) had followed Ovsynch protocol along with insulin injections at different intervals. Shakya (2017) used 100 mg MAP intravaginal sponges for 10 days, additionally, 300 IU eCG on day 9 and/or 125 µg of the PGF_{2α} at the time of sponge removal. A field study using indigenously prepared intravaginal sponge having 350mg natural progesterone (Avikesil-S) along with prostaglandin in Sirohi goats.

Materials and Methods

This study was carried out at farmer's goatery unit located at Nernakallu village, Chinthamani taluk, Chickballapur district of Karnataka State. The study unit is located at 877.00 m altitude, 13° 18' 33.7716" N, 78° 1' 31.3356" E latitude and longitude, respectively. The area receives an average annual precipitation of 672 mm. The average annual temperature at site is 24.0°C. The agroclimatic area falls under eastern dry zone of Karnataka state.

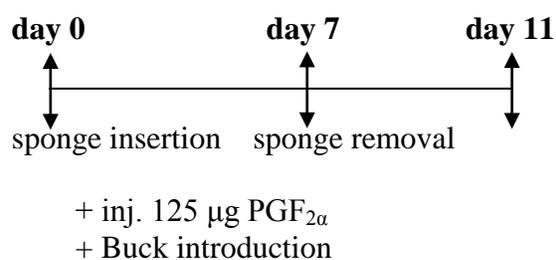
Ten multiparous non pregnant Sirohi goats, aged between two and four years and crossed minimum 60 days post parturient period were selected for the study. Two sexually active and fertile bucks of the same breed were used in the study. All experimental animals were thoroughly checked to rule out any reproductive abnormality and dewormed with Albendazole oral solution before the study. Does were stalled in two separate pens, five in each, with adequate space. Bucks were separated from does for 30 days before study.

The goats were stall fed with one kg of maize silage twice daily and 250 g concentrate/day/doe throughout the study period. Salt licks were tied to barrier walls in individual compartments and concentrate feed was supplemented with commercial mineral mixture. Water was offered *ad libitum*. The

pregnancy confirmed does were fed 200 g extra concentrate after three months of pregnancy and in twin bearing does 20 per cent extra concentrate was offered during later part of the study.

Treatment protocol

All ten does were inserted with intravaginal sponges (Avikesil-S) in situ for seven days at the end of the treatment 125 µg Cloprostenol sodium *i.m.* was injected.



Buck introduction

After treatment protocol, bucks introduced to does, in two separate pens, stranded five does in each. Animals were monitored twice daily (06:00h and 18:00h) for the colour marking on the back of the does. Each buck was painted with different colours at brisket region and was interchanged at every observation between the pens. Fresh colour marking on the back of the does whilst each observation had confirmed the estrus in those does. Time from sponge removal to first mating was considered as interval to estrus, time duration between first and last mating was recorded as the duration of estrus. All does were screened for pregnancy using Real-time B-mode transrectal ultrasound equipment (Honda, HS/2000 with a 5-10 MHz longitudinal transducer, Japan) at 30 days post mating. Pregnant does were observed up to kidding. Reproductive parameters *viz.*, gestation period, kidding rate, type of birth, litter size, sex ratio and birth weight were recorded.

Results and Discussion

Estrus synchronisation in goats have been achieved using intravaginal sponges containing different progestagen agents for longer period (12-18 days) decreased conception rate and vaginitis were common sequel in spite of the significant synchronisation achieved. Indeed, to overcome the shortfalls of long term progestagen therapy short term (5-10 days) protocols have been postulated (Maffili *et al.*, 2005; Dogan *et al.*, 2008; Fonseca *et al.*, 2009). However, when the sponges were removed after seven days, few does exhibited clinical signs of vaginitis, including abnormal haemorrhagic or purulent vaginal discharge with unpleasant odour. These observations are in accordance with Acar *et al.*, (2013). These changes in the vagina were attributed to the physical action and constant absorption and retention of the vaginal secretions by the intravaginal sponge during insertion, which stimulates bacterial growth (Fonseca *et al.*, 2017).

In the present study, 100 per cent estrus response was recorded which revealed the efficiency of Avikesil-S[®] and PGF_{2α} combination in inducing synchronized estrus

in Sirohi goats. PGF_{2α} was used for the elimination of the remnant corpora lutea, after short-term priming with Avikesil, influencing the synchronisation of estrus (Romano, 1996). Uniformity of the time elapsed from the end of treatment to the onset of estrus is an important requirement for successful estrous synchronization. The mean interval to estrus onset was 37.44 ± 3.92 hr in the present study is almost close with time to estrus onset obtained in goats by Cardoso *et al.*, (2018) (36.27 ± 4.59 hr) and Pinheiro *et al.*, (2012) (36.05 ± 9.46 hr).

In the present study, the mean induced estrus duration of 22.80 ± 2.15 hr which is almost close to reports of Cardoso *et al.*, (2018) who obtained mean estrus duration of 24.47 ± 8.71 hr in crossbred Alpine and Anglonubian goats following similar estrus synchronization protocol. On the other hand, Greyling and Van Niekerk (1991), Palhão *et al.*, (2006) and Dogan *et al.*, (2008) have reported mean induced estrus duration of 33.50 ± 9.10 hr, 34 and 31.80 ± 2.40 hr, which are higher than that observed in the present study. The difference in the duration of estrus may be due to the variation in the dosage and duration of treatment along with the difference in age and reproductive status of the goats.

Table.1 Reproductive parameters of synchronised estrus

Parameters	
Sponge retention rate	100
Estrus response (%)	100
Estrus induction	37.44 ± 3.92
Duration of Estrus (hr)	22.80 ± 2.15
Pregnancy rate (%)	70.00
Gestation period (days)	149.14±1.26
Kidding rate (%)	100.00
Litter size	1.00 ± 0.00
Single (%)	100.00
Sex ratio (Male:Female)	28.57:71.43
Birth weight (kg)	3.08 ± 0.13

In the present study, 70.00 per cent conception rate was recorded. This finding is in concordance with those of Shakya (2017) who also reported 66.67 per cent conception rate in Sirohi goats, using 100 mg MAP for 10 days, along with 125 µg of the PGF2α at the time of sponge removal. However, Fonseca *et al.*, (2005) reported the 77.30 per cent conception rates for Toggenburg, Saanen and Alpine goats using 60 mg MAP for six days plus 22.50 µg PGF2α, which marginally higher than the present study.

Though 100 per cent kidding rate was recorded in present study kidding rate of 80 per cent (Amarantidis *et al.*, 2004), 63.00, 65.00 and 63.00 per cent (Romano, 2004) was registered using similar protocol, but for longer duration with different type of progesterone and the kidding rates were lower than the present study. The variations in kidding rates obtained in the present study may possibly subscribe to breed, season and geographical area where the studies were carried out, which are known to influence to kidding rates.

The present finding 100 per cent single kidding rate is at variance with those of Dogra *et al.*, (2016) who reported 14.30 per cent single kidding rate in Beetal goats using norgestomet (Crestar, 1.5 mg) for 11 days with 50-µg PGF2α.

Litter size of 1.00 ± 0.00 observed in the present study closely corroborates with Amarantidis *et al.*, (2004), who obtained 1.30 ± 0.60 litter size in estrus synchronized goats using 45 mg FGA for 12 days with 7.5 mg PGF2α. Cardoso *et al.*, (2018) reported slightly higher mean litter size of 1.50 ± 0.55 using 60 mg MAP intravaginal sponges for 7-days, in addition, 35.5 µg PGF2α, 24 hr before sponges removal in crossbred Alpine and Anglo-Nubian goats.

The mean gestation period of 149.14 ± 1.26 days obtained in the present study in estrus synchronized goats in Group II is in congruence with those of Amarantidis *et al.*, (2004) who also reported 150.6 ± 1.50 days gestation period in estrus synchronized goats with similar protocol.

Sex ratio was 28.57:71.43, male and female kids were born in present study. Mean birth weight of kids born was 3.08 ± 0.13 kg which is higher than the previous observation by Waiz *et al.*, (2018) (2.50 ± 0.39 kg) under natural breeding and grazing practices which is attributed to the better management practices adopted in our study.

Concluding the results of the present study, Avikesil-S[®] intravaginal sponge containing 350 mg of natural progesterone kept for seven days and 125 µg Cloprostenol sodium i.m. Inj at sponge removal is suitable protocol for estrus synchronisation for Sirohi in eastern dry zone of Karnataka agro-climatic region.

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