

REPRODUCTIVE PARAMETERS FOLLOWING ESTRUS SYNCHRONIZATION OF SANGAMNERI AND OSMANABADI GOATS

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ABSTRACT

Sangamneri (n=11) and Osmanabadi (n=7) breed goats (age, 2-4 yr; BW, 22-28 kg) subjected to estrus synchronization protocol (progestagen-impregnated intra-vaginal sponge for 7 days + Inj. eCG i.m. on the day of sponge removal) exhibited 100% estrus response with an earlier onset of estrus in Sangamneri breed (46.9 ± 2.5 vs. 24 ± 6.23 h, $p < 0.05$), longer duration of estrus in Osmanabadi breed (76.4 ± 7.8 vs. 113.1 ± 6.6 h, $p < 0.05$) and similar conception rate in both the breeds (72.7% vs. 57.1%, respectively; $p > 0.05$). Furthermore, out of pregnant goats, 62.5% Osmanabadi goats kidded and 8 kids were born; whereas, in Sangamneri breed, 50% goats kidded and gave birth to 2 kids. The litter size was higher ($p < 0.05$) in Sangamneri (1.6) in comparison to Osmanabadi (1.0) goats. In brief, the reproductive parameters following estrus synchronization were better in Sangamneri compared to Osmanabadi goats.

Keywords: Estrus synchronization, Intra-vaginal sponges, Osmanabadi goat, Reproduction, Sangamneri goat

The profitability of goat keeping depends upon exploitation of fertility potential that can be achieved by assisted reproductive technologies such as controlled breeding through estrus synchronization. Short treatment of intra-vaginal progestagens was used in dairy goats along with eCG at the time of sponge withdrawal or 48 h prior to device removal (Selvaraju *et al.*, 2004). In Maharashtra state, Sangamneri and Osmanabadi are well-recognized dual-purpose Indian goat breeds, however, there is no comparative study on fertility responses of Sangamneri and Osmanabadi goats to a estrus synchronization regimen. Therefore, the present study was undertaken to compare the efficacy of estrus synchronization and subsequent reproductive performance in Sangamneri and Osmanabadi goats.

Sangamneri (n=11) and Osmanabadi (n=7) breed goats (age, 2-4 yr; BW, 22-28 kg) were screened by ultrasonography for the non-pregnant status, absence

of genital abnormalities and were selected irrespective of ovarian cyclicity. All the selected goats were inserted intra-vaginal progesterone device (with 160 mg progestagen) for 7 days followed by 300 i.u. equine chorionic gonadotropin (eCG) administration (i.m.) on the day of sponge removal (day 7). All the goats were monitored twice daily for the behavioral estrus starting from the day of intra-vaginal sponge removal. The assessment of estrus response, onset of estrus, standing estrus and estrus duration was carried out. The goats exhibiting estrus were mated at least twice with the respective breed of bucks. The animals were scanned for pregnancy diagnosis on day 80 after mating using a trans-abdominal ultrasonic scanner with 3.5-5.0 MHz convex probe (Esaote Piemedicals, Holland). Other reproductive parameters recorded were pregnancy rate, kidding rate (number of goats kidded / number of goats pregnant), multiple kidding rate (number of goats kidding twins, triplets / number of goats kidded) and litter size (total kids born / number of goats kidded). Analysis of reproductive parameters between the breeds were performed by using two sample Wilcoxon rank-sum (Mann-Whitney) test.

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Table 1: Reproductive parameters following estrus synchronization of Sangamneri and Osmanabadi goats

Parameters		Sangamneri, n=11	Osmanabadi, n=7
Estrus response, %		100	100
Duration for onset of estrus, h		46.9±2.5 ^a	24±6.3 ^b
Duration of estrus, h		76.4±7.8 ^a	113.1±6.6 ^b
Conception rate, %		72.7 (8/11)	57.1 (4/7)
Kidding rate, % (n)		62.5 (5/8)	50 (2/4)
Multiple kidding rate, %		40 (2/5)	0 (0/2)
Litter size, n		1.6 ^a	1.0 ^b
Kids born	Total, n	8	2
	Singleton, n (%)	3 (37.5)	2 (100)
	Twin, n (%)	1 (12.5)	0
	Triplet, n (%)	1 (12.5)	0
	Female, n (%)	4 (50)	2 (100)
	Male, n (%)	4 (50)	0
	Weight female, kg	1.60±0.23	1.90±0.10
	Weight male, kg	2.05±0.35	-

^a vs. ^b P<0.05

In the present study, the prominent estrus symptoms in goats were the tendency to cluster round the buck at the time of estrus detection, attraction towards male and keeping alliance with males kept in the adjacent pens. The incidence of wagging of tail was higher in goats in estrus. Increased restlessness and frequent urination was the other signs of estrus. Intermittent bleating was observed in few goats during estrus. The intensity of swelling of vulva was less prominent and estrual discharge was observed in only one Osmanabadi goat. Three Sangamneri goats exhibited continuous estrus behavior until fifth to sixth day after sponge removal. Similar observations were recorded earlier in synchronized Assam local goats (Bhattacharya *et al.*, 2000) and in Jakhra goats of Indian origin (Goel and Agrawal, 2002).

Following estrus synchronization, the estrus response was 100% in both Sangamneri and Osmanabadi breeds of goats (Table 1), as reported earlier (Whitley and Jackson, 2011). The duration for the onset of estrus following progestogen withdrawal

was longer ($p<0.05$) in Sangamneri goats, whereas, the duration of estrus was longer ($p<0.05$) in Osmanabadi goats, compared to their respective counterparts (Table 1).

Nevertheless, Sangamneri goats exhibited better conception rate (72.7%) compared to Osmanabadi goats (57.1%, $p>0.05$, Table 1). The kidding rate recorded in the present study was lower (Table 1) than the earlier study (82.2%; Nogueira *et al.*, 2011). The overall litter size was higher ($p<0.05$) in Sangamneri goats (1.6) than Osmanabadi goats (1.0, Table 1). These results agree with earlier the reports in West African dwarf goats (Adeoye, 1986).

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