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Kidding rate following synchronization of ovulation in Tellichery goats

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Abstract
A study was conducted on synchronization of ovulation protocols during winter and summer seasons in Tellicherry goats. Total of 60 Tellicherry does were selected. Out of this 30 does during winter season and the remaining 30 does during summer season. The selected does of each season were divided into three experimental groups *viz*., Groups I(Control group), II and III (Treatment groups). In Group II, all the does were treated with Ovsynch protocol. In group III, does were treated with Cosynch protocol. AI was done 16-18 hrs in Group I and at the time of second GnRH in group II. The does of group I was observed for oestrus from the time of selection during each season and was bred by AI during the observed oestrus. During winter season, the overall percentage of kidding rates were 50.00 in group I; 70.00 in group II; 60.00 in group III. The corresponding values in groups I, II and III during summer season were 50.00; 60.00; 50.00 per cent, respectively. The overall kidding rates recorded following synchronization of does were 60.00 and 53.33 per cent during winter and summer seasons, respectively. From this study, it was concluded that the entire synchronization programme employed in this experiment improved the kidding rates in Tellicherry does.

Keywords: Oestrum, synchronized, Ovsynch, Co synch, GnRH

Introduction
Goats are important livestock species of India. Goat husbandry plays an important role in the livelihood of a large proportion of small/ marginal farmers, landless labourers and sustains the rural economy, with multi-facet utility for chevon, milk, skins and manure. There is rich biodiversity among the indigenous goat in India, evidenced by more than 20 listed breeds of goat. India stands second in the world's goat population with 148.88 million which constitutes 27.79% of the total livestock population (20th livestock census, 2019). In India, Tamil Nadu state stands 7th position with 9.89 million populations. Goat rearing provides income and livelihood to the poor and most of the small and marginal farmers showing interest in rearing goat due to smaller investments, short reproduction cycles, faster growth rates and greater environmental adaptability. Assisted reproductive technologies (ARTs) are powerful tools to enhance reproductive efficiency of small ruminants by increasing estrus response rate, estrus synchronization, pregnancy rate and prolificacy in shorter duration even in non-breeding seasons. Even though, the goats are polyoestrus, they do not express clear-cut signs of oestrus, as seen in cows and are mated arbitrarily. Further, it is not possible to obtain uniform kidding distribution throughout the year using natural oestrus as the oestrus behaviour is not expressed properly during hot summer (Pietroski *et al*., 2013) [7].
Numerous studies in bovines indicated that the pregnancy rates to the Ovsynch / Co-synch program were comparable and in some studies greater than the appropriate control group. But such studies are lacking in goats especially in Tellicherry breed. The present study aimed to discuss the efficacy of different synchronization of ovulation and timed artificial insemination programme to enhance the fertility rate in Tellicherry goats in summer and winter season.

Materials and Methods
A total of 60 does were utilized for this study. Out of 60 does, 30 does were during winter season (from October to January) and the remaining does were treated during summer season (from April to July). All the selected does including control were dewormed orally with albendazole at the dose rate of 5 mg/kg B.W at the time of selection.

Further, all the experimental does were supplemented orally with TANUVAS mineral mixture at the rate of 15-20 g per day per doe for 30 days from the day of selection. The selected does divided into three experimental groups *viz*., Groups I (Control group), II and III, (Treatment groups) and hence, each group consisted of 10 does. In group –I does were observed for estrus from the time of selection during each season and bred by AI during observed estrum. In group II, does were treated with Ovsynch protocol which consisted of an intramuscular injection of 10 µg of GnRH on the day of start of synchronization of ovulation (day 0), 250 µg of PGF2α seven days later (day 7) and another 10 µg of GnRH (2nd GnRH) at 48 hours after the PGF2α injection (day 9). AI was done 16-18 hrs after second GnRH injection. In group III, were subjected to co-synch protocol which was similar to Ovsynch protocol except that breeding was done at the time of 2nd GnRH injection in each season.

Results and Discussion

The kidding rates obtained following synchronization of ovulation protocols in does are presented in Table 1. During winter season, the overall percentage of kidding rates were 50.00 in group I; 70.00 in group II; 60.00 in group III. The corresponding values in groups I, II and III during summer season were 50.00; 60.00; 50.00 per cent, respectively. The overall kidding rates recorded following synchronization of does were 60.00 and 53.33 per cent during winter and summer seasons, respectively. In ovsynch treated groups (group II) of winter and summer season in the experiment exhibited 70.00 per cent kidding rate. Similar results were found by Selvaraju and Karthiresan (1999) [8] in Tellicherry does, Holtz *et al.* (2008) [5] and Panicker *et al.* (2015) recorded 58 per cent kidding rate in ovsynch treated goats. The increased kidding rate in this group of this experiment might be related to the start of protocol during early to mid-diestrum as indicated by elevated serum progesterone. In this investigation, co-synch treatment (group III) yielded kidding rate of 60.00 and 50.00 per cent in winter and summer seasons, respectively. Perusal of literatures revealed no report on the kidding rate following co-synch treatment in goats. However, Carba and Velicevici (2013) [4] reported 57.00 per cent conception rate in cows with co-synch treatment. The result of the study indicated that co-synch protocol proved to be effective in increasing the kidding rate when compared to control goats.

It was clear that the kidding rate following synchronization of oestrus /ovulation was influenced by the seasonal factors. Amoah *et al.,* (1996) [2] reported conception rate of 50.00 to 70.00 per cent depending on the season of insemination. The increased overall kidding rate during winter season in this study would be related to the availability of green fodder (Ahmed *et al.*, 2014) [1], cool environment and absence of heat stress (Mellado and Herra, 2002) [6]. Further, increased serum cortisol in goats during summer season might have caused early embryonic death which might have reduced the kidding rate as described by Bonia *et al.* (2015) [3].

Table 1: The kidding rates obtained following synchronization of ovulation protocols in does are presented

S. No	Groups		No of does treated	Kidding rate % (Artificial insemination)
1	Winter season (Oct-Jan)	Group-I (Control)	10	50.00 (5/10)
2		Group-II (Ovsynch)	10	70.00 (7/10)
3		Group-III (Cosynch)	10	60.00 (6/10)
			30	60.00 (18/30)
1	Summer season (April to July)	Group-I Control)	10	50.00 (5/10)
2		Group-II (Ovsynch)	10	60.00 (6/10)
3		Group-III (Cosynch)	10	50.00 (5/10)
Over all			30	53.33 (16/30)

Conclusion

From this study, it was concluded that the entire synchronization programme employed in this experiment improved the kidding rates in Tellicherry does. Based on the findings of the investigation, it is concluded that synchronization of ovulation (Ovsynch) found to be the best protocol to increase the kidding rates in Tellicherry goats in both the season.

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