

Original Research Article

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## Genetic Upgradation of Indigenous Does Through Oestrus Synchronization and Artificial Insemination with Cyprus Shami Buck Semen

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### ABSTRACT

#### Keywords

Genetic upgradation, Oestrus synchronization and Artificial insemination

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The present study aimed at genetic up gradation of indigenous does with Cyprus Shami buck through oestrus synchronization and artificial insemination. The study was undertaken in Tellicherry goats and local goats under uniform management and feeding condition. The 30 to 45 days postpartum 53 numbers of Tellicherry and 36 numbers of local indigenous does were selected in this study. Does were synchronized with progesterone intra vaginal sponge, PMSG and PGF<sub>2α</sub> combination. Out of 53 tellicherry does were inseminated, five goats were pregnant, three does delivered twins and two does delivered single kid. Out 36 local goats only two goats were pregnant. The present study concluded that progesterone containing intra vaginal sponges, PGF<sub>2α</sub> and PMSG combination can be used for effective synchronization of estrus programme in goats and tellicherry does were inseminated with Cyprus Shami buck semen giving higher growth rate than local does.

### Introduction

Goat population rises at higher rate compare to sheep which indicate growing role of goats as a food producing livestock. As per the 20<sup>th</sup> Livestock Census (2109) total goat population in the country is 148.88 million which comprises of 142.44 million in the rural area and 6.44 in the urban area. 20<sup>th</sup> Livestock

Census revealed total goat population has increased by 10.14% compare to the 19<sup>th</sup> (2012) Livestock Census (DAHD, 2019). Goat rearing becomes a future hope for self employment, generation of more employment, nutritious food security and uplifting socio-economic status of small and marginal farmers. Assisted reproductive technology and improving the production

traits of indigenous goats through genetic upgradation with superior goat breeds is the best way to fulfil the production needs in order cope up with the growing population.

Breeds of goats with high productivity are the Boer from South Africa and the Damascus (Cyprus Shami) of the Near East (Trevor Wilson, 2009). The Shami goats are native of Syria and other Near East countries. Shami breed is considered as one of the top five global breeds of goat known for their capacity to yield high milk and their ability to give birth twins twice a year (Mavrogenis *et al.*, 2006) in a suitable environment. Fertility rates were 80 to 90 per cent which is characteristic of most goat breeds with high milk production. Prolificacy, however, is high and averages 1.80 kids per doe kidding. Milk yield of Shami goat up to weaning of off springs range from 528 - 682 litres according to the season (Omer *et al.*, 2015). Administration of intravaginal sponge containing progesterone in small ruminants including goat were used worldwide for synchronization and induction of estrus (Kridli *et al.*, 2002). The value of estrus synchronization is vital in goats as the duration of both estrous cycle and estrus is variable and estrus detection cannot be accomplished safely without a buck (Rahman *et al.*, 2008).

The goat rearing will serve as source of livelihood and income for the farming communities by the sale of kids at short interval with higher body weight. In the recent years goats breeding programs are carried out in many countries of the world and have led to development of specialised breeds (Abd-Allah., 2014, Abd-Allah., 2015). The productive and reproductive performances of goats were increased by shortening of the postpartum period through estrus synchronization and inseminate with higher pedigree exotic buck semen. In India goats were mainly reared for the meat production

and incorporation of exotic pedigree goat which have higher prolificacy, shorter lambing interval, ability to produce twin births or triplets, higher birth and weaning weight, higher milk yield can be utilized for upgrading the native breeds. One among such goat breed which is not tested in our conditions was Cyprus Shami goats which was utilized in the study.

## **Materials and Methods**

The study was carried out on 89 does which are ranging from 30 to 45 days postpartum consist of 53 numbers of Tellicherry and 36 numbers of local indigenous does maintained at Livestock Farm Complex, Tamil Nadu Veterinary and Animal Sciences University, Madhavaram Milk Colony, Chennai, Tamil Nadu, India. The does were kidded 2 to 4 times. All the does were maintained with similar feeding, watering and other management practices. The does with good general health condition and sound reproductive history were included in the study. Does were synchronized with progesterone impregnated intra vaginal sponge (CSWRI, Avikanagar), PGF<sub>2α</sub> and PMSG combination, inseminated with frozen semen of Cyprus Shami buck (Fig.1). Pregnancy diagnosis carried out with the help of ultrasonography from 30 days post breeding (Fig.2) and kidding rates were recorded.

## **Experimental design**

Group I consist of 53 numbers of Tellicherry does and Group II consist of 36 numbers of local does. Following synchronization protocol were utilized for the both Group I and Group II viz, Intra vaginal sponges (CSWRI, Avikanagar) were administered on Day 0, Inj. Cloprostenol 125 µg (Pragma, Intas Pharmaceuticals) administered intramuscularly on Day 10 at 8AM,

intravaginal sponge removed and Inj.PMSG-200 IU (Folligon, MSD Animal Health) administered intramuscularly on Day 11 at 12 Noon and fixed time artificial insemination at 8 hrs interval was carried out on Day 13 at 8 AM and 4 PM.

## Results and Discussion

Out of 53 tellicherry does inseminated with Cyprus Shami buck frozen semen, five goats were pregnant, three does delivered twins and

two does delivered single kid. Out 36 local does inseminated with Cyprus Shami buck frozen semen only two goats were pregnant and both delivered single kid. Average birth weight of Tellicherry Shami cross bred (Fig.3) and Local Shami crossbred kids were  $2.7 \pm 0.14$  Kg and  $1.5 \pm 0.32$  Kg. Average daily weight gain of Tellicherry Shami crossbred and Local does Shami crossbred kids were  $156 \pm 0.17$  g/day and  $128 \pm 0.42$ g/day.



**Fig.1** AI with Cyprus Shami buck Semen



**Fig.3** Pregnancy diagnosis by ultrasonography



**Fig.4** Tellicherry - Shami cross bred kid

Meenakshi Sundaram *et al.*, (2012) reported that the average birth weight of Tellicherry kids were  $2.34 \pm 0.72$  Kg. Senthilkumar and Daisy (2018) reported that the average birth weight of Tellicherry Boer crossbred kids was  $2.38 \pm 0.10$  kg. In the current study average birth weight of Tellicherry Shami crossbred kids were  $2.7 \pm 0.14$  Kg. Since, birth weight is considered as main criteria for selection and improvement of body weight during later part of life (Singh *et al.*, 2000) Tellicherry Shami crossbreeding program can be utilized as a tool for improved production. Muthuramalingam *et al.*, (2015) reported that the average daily weight gain of Tellicherry kids were  $140.89 \pm 0.31$  gram whereas Tellicherry Shami crossbred kids was  $156 \pm 0.17$ g/day which revealed the Tellicherry and Shami crossbreeding have a potential for profitable goat production.

Artificial insemination, in the developed countries, is the good example of how tremendous improvements can be made in both genetics and reproductive management of goats by using synchronization methods. However, the result of AI and conception obtained till date is not so convincing due to lack of skilled technicians, timely unavailability of liquid nitrogen at remote areas, and improper husbandry practices followed by farmers (grazing and feeding). Thus, AI program needs to be reviewed and practiced on station first to improve the conception rate before wide dissemination.

The present study conclude that the progesterone impregnated intra vaginal sponges,  $PGF_{2\alpha}$  and PMSG combination can be used for effective estrus synchronization programme in goats. Crossbreeding of

Tellicherry with Cyprus Shami buck semen can be utilized for profitable goat production. Since limited research work has been done it need further studies to standardize the methods in Tellicherry Shami crossbreeding and to improve conception rate to explore the potential of Cyprus Shami bucks for genetic upgradation of indigenous breeds.

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