



Male Effect: A Way to Improve Reproductive Efficiency in Small Ruminants

MM Islam* and CP Parmar

Pashupalan Sanshodhan Kendra, Veterinary and Animal Science Research and Extension Unit, Kamdhenu University, Ramna Muvada, Gujarat

***Corresponding Author:** MM Islam, Pashupalan Sanshodhan Kendra, Veterinary and Animal Science Research and Extension Unit, Kamdhenu University, Ramna Muvada, Gujarat

Received: September 26, 2023

Published: November 01, 2023

© All rights are reserved by **MM Islam and CP Parmar.**

One of the first animals that humans discovered as a ready and convenient source of meat was Goat. However, the importance of milk, skin and hair from goat was understood by human very late. In many poor rural areas of the world, goats along with sheep are vital to the socioeconomic well-being of the community. These animals easily adapt to high-intensity farming practices and efficiently transform their feed into extremely nutritious milk and meat. According to the current distribution of goats in the world, more milch-type goats are found in the temperate zone, while dual-type or meat-type goats are mostly found in sub- and tropical Asian and African nations. According to recent statistics of Govt. of India, population of sheep (14.13%) and goat (10.14%) has increased maximum among major livestock species during last inter-censal period from 2012 to 2019. This increase in population of sheep and goat indicates that there is increased demand of small ruminants for meat and milk. During the year 2021-22, contribution of goat in India's total milk production was 2.93%. While sheep and goat contributed 10.33 and 13.63 % in total meat production in India, respectively. Per capita availability of meat in India is about 18g/d which is much lower than the ICMR recommendation of 30g/d and this may be achieved by the meat of sheep and goat as there is no religious taboo as far as mutton and chevon is concerned. Due to this importance of sheep and goat, National Livestock Mission intended to achieve the objectives of employment generation through entrepreneurship development in small ruminant.

The need for successful reproduction is the most crucial prerequisite to improve the production of meat from sheep and goat. Due to the consequences of poor nutrition and other environmental conditions, it can be relatively troublesome in tropical nations

like India. Numerous attempts have been made to regulate and manage livestock reproduction by applying biological agents and using hormones. Oestrus synchronization is a crucial component of small ruminant-controlled reproduction as large number of does/ewes are bred over a short period of time. Nowadays, oestrus synchronization via hormone treatment is employed to enhance goat reproductive efficiency. These hormone treatments have not been consistently successful up to this point, and some of these biologicals are either difficult to get by or prohibitively expensive for farmers in underdeveloped nations. Therefore, to fully use the reproductive potential of small ruminants in developing nations like India, management measures such as pheromones and bio stimulation may need to be developed. Utilizing the 'male effect' can help to lengthen the breeding season and offer a respectable level of synchronization.

The 'male effect' refers to the induction of synchronous oestrus behaviour and ovulation in anovulatory females following the introduction of a male. This response is frequently employed to expedite and synchronize sheep and goat breeding. Without any understanding of the underlying physiology, livestock keepers have traditionally used this as a strategy to manipulate small ruminant reproduction. Later research has shown that this phenomenon may also be influenced by pheromonal, behavioural, tactile, and other factors. In today's health-conscious and "organic"-focused developed world, the 'male effect' is one of the well-established techniques for controlling goat reproduction without utilizing hormonal therapy, which has received significant criticism.

The 'male effect' is a well-researched phenomena in sheep and goats where the primer pheromone released by sexually mature males enhances the luteinizing hormone (LH) pulse frequency and causes oestrus in receptive females during the anoestrous period. The gonadotropin-releasing hormone (GnRH) pulse generator generates intermittent GnRH discharges into the portal vessels and thereby regulates the pulsatile LH secretion into the peripheral circulation. Therefore, it is believed that the hypothalamus GnRH pulse generator is the primary target of the male effect pheromone. The male effect is a multi-sensory phenomenon that uses clues from the senses of smell, sight, touch, and sound and when all cues are present, a high percentage of females react to male stimulation.

There is considerable scope for improving the reproductive management of sheep and goat by using the male effect to initiate and synchronize reproductive activity in anoestrus females. When a male is introduced, a large percentage of responsive females do ovulate within 3 days, with varied behavioural oestrus display and often low fertility. Usually, a second ovulation with viable oestrus follows a brief luteal phase of around 5 days with little release of luteal progesterone. This second ovulation often takes place 7-12 days later. At this second ovulation, the ovulation rate can be increased. However, nutritional status, breed, male aggression, female parity etc. affect the proportion of animals responding to the male stimulus.

Male effect can also be applied in order to accelerate the beginning of puberty and oestrus which will work successfully under the optimum managerial conditions viz. good health, favourable environment, nutrition etc. For getting higher number of females in oestrus by male effect, it is advised to keep the males separate from females initially as exposure of male is a unique stimulus for induction of oestrus. At the same time many researchers also suggest that there is no effect of initial separation of male from females for induction/synchronization of oestrus in females.

The way in which the two sexes interact may influence how the females react to the male effect. Contact through an opaque fence is less effective than through an openwork fence, and the maximum effect is achieved in all cases when the females are allowed full physical contact with the males. It is also observed that to maximize the response to the male effect, male does not have to be present continuously until ovulation. Thus, male effect may be helpful in synchronization as well as induction of oestrus in female sheep and goat for improving reproductive efficiency in the most natural way.