JIVA, 6(1):2008, 12-14

ARTIFICIAL INSEMINATION IN GOATS - IS THE TIME RIPE?

K.C.Raghavan

The white revolution which swept the country in the eighties boosted milk production to unprecedented levels. In Kerala too, a spurt in milk production of dairy cattle could be achieved because of wide spread genetic improvement programmes using exotic germplasm. Artificial insemination (AI) is the biggest tool for this. Presently, around 90% of cattle population has been brought under artificial insemination programmes. The question often asked is the reason why this success story could not be repeated in goats. This article tries to answer this question and examine how different breeding methods could be best used for the genetic improvement of goats of our state in the prevailing situation.

At present natural service is the commonly used breeding method in farmers' flocks. AI with liquid semen and frozen semen is practiced on a limited scale by different agencies. AI has many advantages over natural service and these advantages should be exploited to the best interest of the farming community and the State. No advanced technology will be useful unless it is proved profitable to farmers. Let us examine the advantages cited in favor of AI and examine it in the present scenario of the State, for bringing about the desired genetic improvement of our goats.

1. Widespread use of exotic and highly expensive germplasm with increased genetic merit

Artificial insemination is being widely practiced in cattle for crossbreeding with exotic germplasm of high production potential. As far as our State is concerned, it was a necessity for increasing the milk production of very low producing indigenous nondescript cattle. (That this has created a near total elimination of local cattle germplasm of the state is another issue to be discussed separately. But it is heartening to see people who earlier blamed the conservationists now running from pillar to post for the propagation of these native germplasm!!) . However, attempts to increase productivity of native goats by crossbreeding with exotic animals resulted in very little success. Though there was an increase in performance initially, crossbred goats with European blood did not acclimatize to our conditions and many characters like high prolificacy were lost from the crossbred population. When these attempts were being made, our local breed Malabari had not been studied properly, but now it is a known fact that goats having performance comparable to many of the high producing breeds elsewhere in the country as well as exotic crossbreeds are available in the state. Selections from our Malabari breed and other local types often equal or excel over many of these animals. A selective breeding programme will facilitate the use of our own acclimatized breeds for the breeding programme of the State, thereby conserving this valuable germplasm. A planned programme is necessary for this. Since these animals are available in plenty. AI with exotic and expensive germplasm is unnecesary.

2. Increased pace of genetic improvement

The biggest advantage with AI is that the best germplasm can be propagated faster and genetic improvement will be rapid. Considering the loss farmers have to face because of the increased number of services per conception with the present frozen semen technology (discussed elsewhere) it is preferable to use AI only for production of large numbers of elite bucks, under expert supervision in University or Government farms. These elite germplasm centres, in turn will provide elite breeding bucks to breeding units which can multiply these bucks and supply them to commercial units. There is no doubt that the rate of genetic improvement is faster with AI. In cattle, exotic animals are very costly and the cost for maintaining them is also very high. In goats best germplasm is available for Rs.100-125/kg which means that an animal of 30 kg will cost somewhere between 3000 to 3750 rupees. Our experience in the field is that farmers are coming forward to rear bucks. In goats, the maintenance cost is not high and often buck rearing is a source of income to the farmers. Though buck can be used for crossing 150 times a year, experience shows that it is used for only about 100 services which means, 100 X 100 =

10,000 rupees per year. With a rearing cost of Rs. 3650/- per year, within two years the farmer can earn an amount of Rs. 12,700/- by breeding alone. The cost of buck at the end of two years will be 40kg X 100 = Rs. 4000/-. Subtracting the initial cost of Rs. 3000/-, farmer gets a profit of Rs.1000/- which means revenue of Rs.13700/- in a period of two years by maintaining a buck. This has been observed in the Tellichery, Badagara and Tanur centres of All India Coordinated Research Project (AICRP) on Malabari Goat Improvement. So the rate of genetic improvement can be increased also with natural service by production and supply of large number of bucks.

3. Reduction in the cost of maintaining bucks

With artificial insemination, the number of does inseminated with semen from a single buck will always be higher. With less number of bucks used in the population, the genetic base will be greatly narrowed and the probability of increased inbreeding will also be higher. Since maintaining bucks is a profitable business for farmers, encouraging buck rearing will be promoting a means of livelihood for them.

4. Estrous synchronization and AI allow several does to be bred on the same day

Estrous synchronization allows several does to be bred on the same day and this can be practiced in farms where the population of goats is at least 50. However, the average herd size of goat farmers is 2.5 in Kerala, and oestrous synchronization measures will not be advantageous to them.

5. Decreased spread of infectious reproductive disorders

Although undoubtedly spread of infectious reproductive disorders can be more in natural service, infections with AI also cannot be ruled out. Infections of the reproductive system are one of the major reasons for cattle infertility where more than 80% are covered under AI. Strict hygiene is to be maintained and aseptic measures will have to be taken in both cases to reduce the incidence.

6. Economics of production under natural and AI system

The average age at first kidding in Malabari goats is 381.36 ± 18.35 days and the average inter-kidding interval is 263.15 ± 15.62 days. The conception rate with liquid semen recorded in Kerala Agricultural University is 35.08% and with frozen semen it is 21%. With natural service the conception percentage is not less than 80. Assuming the same level of management, heat detection methods and technicality in the farmer's flocks (which is rarely true), the number of inseminations required for conception is 1.25, 2.85 and 4.76 respectively.

The average service period under natural system of mating is 113 days. If the number of services required is 2.85 it can go up to 146.6 days with a difference of 33.6 days. If the cost of maintaining a goat is taken as Rs.6/- per day, the additional burden for a farmer in the present condition will be Rs. 201.6/- per goat. With frozen semen the difference will be Rs. 442.26/- which will be one fourth of the price of a doe.

So it is clear that if a farmer is going for A.I. with frozen semen he has to shell out an additional amount of Rs.442.26/- for maintaining a doe. The cost of insemination with frozen semen will be approximately equal to the cost of a natural service. But the faster genetic improvement that AI produces with better quality bucks cannot be ignored. For this purpose the present conception percentage is to be increased and should a minimum of 50%. The difficultly in freezing goat semen is one of the limiting factors for the development of AI in goats. The fertility rate depends on freezing method, time of insemination from onset of estrous, number of inseminations per heat period, concentration of sperms per dose of insemination and the site of deposition of semen. The conception percentage reported in

A Malabari Buck

this article is based on the data obtained from the University Goat Farm where the insemination was done overcoming the limiting factors mentioned except the inadequacies in freezing techniques. One of the major problems in the field is the accurate detection of heat symptoms, which is usually done in the farm using teaser bucks. More trials have to be conducted on semen preservation and the frozen semen should be taken to the public only after getting satisfactory results under farm conditions where the situations are usually ideal. Insemination with fluid semen gives better conception percentage and can be done in places where bucks and recipients are in the same or nearby locations.

Conclusion

To conclude, it appears that time is not yet ripe for widespread adoption of artificial insemination under field conditions using frozen semen. We should be aware of the loss this creates to the state in terms of extending the inter-kidding interval of goats. Liquid semen which can be stored only for two days under refrigeration, though it gives better conception percentage, can be adopted only in organized farms and where semen collection and dilution facilities are available.

For natural service there is a shortage of good quality bucks, which can be rectified by rigorous selection and supply of quality bucks from farmers' flocks. These selected bucks can be reared in elite germplasm centres which can be under private or pubic sector and subsequently distributed to farmers.

References

Afsal, K. 2003. Fertility of oestrous synchronized crossbred Malabari does Inseminated with boer buck semen. M.V.Sc thesis, Kerala Agricultural University.

Ibrahimkutty, C. 1995. Seasonal Fertility of Billy goats. . M.V.Sc thesis, Kerala Agricultural University.

Progress Report. 2007. All India Coordinated Research Project on Malabari goat improvement, Kerala Agricultural University. Kerala Agricultural University.

Timon, V.M and Hanrahan , J.P.(Ed) 1986 Small ruminant production in the developing countries. Food and Agricultural Organisation of United Nations, Rome

Author

Professor, Centre for Advanced Studies in Animal Genetics and Breeding
College of Veterinary and Animal Sciences, Mannuthy, Trichur