The Pharma Innovation Journal 2023; SP-12(9): 1010-1012

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(9): 1010-1012

www.thepharmajournal.com
Received: 11-07-2023
Accepted: 17-08-2023

Umar Y Wani
Department of Sheep Husbandry, Sheep and Wool Development, Uri, Baramulla, Kashmir, Jammu and Kashmir, India

Shabir A Khan
District Sheep Husbandry Officer, Department of Sheep Husbandry, Ramban, Jammu, Jammu and Kashmir, India

Showkat A Ahanger
District Sheep Husbandry Officer, Department of Sheep Husbandry, Baramulla, Kashmir, Jammu and Kashmir, India

Suhail N Magray
Sheep and Wool Development Officer, Department of Sheep Husbandry, Bandipora, Kashmir, Jammu and Kashmir, India

Mubashir A Rather
Senior Epidemiologist, Department of Sheep Husbandry, Disease Investigation Nowshera Srinagar Kashmir, Jammu and Kashmir, India

Javid A Baba
Disease Investigation Nowshara Srinagar, Department of Sheep Husbandry Kashmir, Bacteriologist, Jammu and Kashmir, India

M Aroof Shah
Assistant Director Sheep Breeding Farm Kralpathri, Department of Sheep Husbandry, Budgam, Kashmir, Jammu and Kashmir, India

Corresponding Author:
Mubashir A Rather
Senior Epidemiologist, Department of Sheep Husbandry, Disease Investigation Nowshera Srinagar Kashmir, Jammu and Kashmir, India

Artificial insemination in backyard goat farming: A new prospect for scientific Goat breeding in changing scenario of Kashmir

Umar Y Wani, Showkat A Ahanger, Shabir A Khan, Mubashir Ali Rather, Suhail N Magray, Javid A Baba and M Aroof Shah

Abstract
Artificial insemination is the deliberate introduction of sperm into a female's cervix or uterine cavity for the purpose of achieving a pregnancy through in vivo fertilization by means other than intercourse. A total of 140 goats of different genetic groups were inseminated artificially at Bandipora on experimental basis under field conditions using Fresh liquid and frozen semen. Overall kidding percentage of 25.66 was observed in the present study. Signicantly, higher kidding percentage of 32.69 was observed using fresh semen in comparison to frozen semen (22%). A significantly (p<0.01) higher sperm abnormalities were observed in frozen-thawed semen (11.18±0.42 to 16.55±0.09%) than that of fresh semen (8.82±0.24 to 9.71±0.52%). 20 number of kids were born in local non-descript goats out of 80. A total of six kids were born (one Jamnapari, one Barbari and four Beetel kids) out of 20 kagani goats. It is concluded that artificial insemination has potential for genetic improvement of goats reared in backyard system as quality bucks are sold at earlier ages by farmers for meat purposes.

Keywords: Artificial insemination, backyard goat farming, bucks, Barbari

Introduction
Kashmir valley holds a good potential for milch goats owing to increasing population with subsequent increase in demand for milk and milk products. As goats can be maintained on a small area of land and survive on a wide variety of grasses and feed, they play a pivotal role in current scenario where pastures are shrinking day by day. Goat rearing is age old practice in Jammu and Kashmir and plays a vital role in the socio-economic upliftment of the weaker sections of the society (Rather *et al*., 2020) [13]. Generally, farmers in Kashmir valley keep goats in small numbers for milk production. Good quality bucks with good genetic merit are sold at early age for indiscriminate slaughter (Rather *et al*., 2020) [13] forcing farmers to bred good quality goats with available low quality bucks. Also, good numbers of does remain without service due to non-availability of breeding bucks. For increasing milk yield and to reverse the trend of unavailability of good bucks, negative selection artificial insemination (AI) can be used as an alternative. Artificial insemination (AI) is a technique well adapted in dairy cattle and buffalos. The technique involves collection of semen from reproductive tract of male animals and transfer of same to the reproductive tract of female animals (Smith. 2009) [15]. AI helped India to achieve the highest milk production of the world. AI is increasingly being used by goat producers because it allows for both dissemination of valuable genetics and control of sexually transmitted diseases.

Materials and Methods
The experiment was undertaken at Bandipora. Fresh liquid semen was used in 40 Kagani does and frozen semen in 80 local non-descript and 20 Kagani goats. The station is located at 34º42' latitude N and 74º69' longitude E, with an elevation of 1811 meters and about 65 kilometers from Srinagar.

Semen collection
Fresh semen was collected using dummy. Artificial vagina (AV) having outer casing of plastic 15-20cm x 5-6cm and an inner liner made of latex was used. The artificial vagina was inflated through the tap to maintain optimum pressure and temperature of 42-45 °C for proper ejaculation.

To prevent sperms from cold shock, the collecting tube was warmed to 30 °C -37 °C before collections. The semen collected was diluted using egg yolk tris buffer. About 0.5 ml of diluted semen was deposited into the cervix using sterile syringe and pipette.

Synchronisation and detection of oestrus

For synchronization NCSynch-TAI protocol was used. Pgf2@0.5 ml was administered intramuscularlly on day 1. On day 8, does were given GnRH 2 ml i.m. Seven days later, on day 15, second dose of pgf2 @ injection was given to induce luteolysis. After 72 hrs on day 18-19 does were artificially inseminated along with second dose of GnRH injection to induce LH surge and ovulation [4]. Estrous detection in goats from the field was performed by history from the farmers and use of teasers.

AI in goats

The frozen semen of improved Goat breeds comprising of Jamunapari, Barbari, Sirohi and Beetel was procured from BAIF (Bharatiya Agro Industries Foundation) pune. Does in estrus were restrained in such a way that the rear quarters were elevated by lifting the hindlimbs at the time of A.I. A lubricated glass speculum was inserted into the vagina after sterilizing the vulvar region of the goat. A head torch was used to illuminate the cervix and the external os was located. The insemination gun was inserted through the vaginal speculum, fixed into the external os and then manoeuvred deeply into the cervix as far as possible followed by slow release of semen. The females were held in the same position for 2-3 min and the vulva was massaged gently. Goats where hormones were not used, insemination was done between 10 to 12 h after detection of standing heat, and a second AI was performed 12 h later.

Results and Discussion

The study was conducted to see the scope of Artificial Insemination in goats. Generally, small number of goats and that too females are reared by the farmers in Kashmir valley. Since, good quality bucks are sold at an early age for chevon and non-availability of bucks for breeding, artificial insemination shall play a pivotal role in the goat husbandry.

Overall kidding percentage of 25.66% was observed in the present study (Table 1). Contradictory to present study, higher kidding rate was reported by Apu *et al*. (2012) [19]. Signicantly (p<0.01) higher kidding percentage of 32.69% was observed using fresh semen as compared to 22% kidding percentage observed for frozen semen. Present study is in consonance with the findings of Apu *et al*. (2012) [19] who reported higher kidding percentage for liquid fresh semen (59.8%) as compared to frozen semen (43.9%). A significantly (p<0.01) higher sperm abnormalities were observed in frozen-thawed semen (11.18±0.42 to 16.55±0.09%) than that of fresh semen (8.82±0.24 to 9.71±0.52%). 20 number of kids were born in local non decript goats out of 80. A total of six kids were born, 4 kids from group 1 and 2 kids from group 2. One Jamnapari, one Barbari and 4 Beetel kids were born. Group 1 with natural estrous has shown 40% kidding rate while group 2 in which estrous synchronization protocol was followed only shows 20% kidding rate. The conception rate of AI varies with protocol used, breed and size of goat (Dhara *et al*., 2023) [5]. Different AI techniques *viz*: Vaginal (peri cervical) insemination, cervical (intra-cervical) insemination, laparoscopic intrauterine insemination and trans-cervical intrauterine insemination have conception rate of 5-15% (Evens and Maxwell, 1987; Nuti, 2007) [6, 9], 40-80% (Nuti, 2007) [9], 60-80% (Shipley *et al*., 2007; Parkinson, 2009) [14, 10] and 71% (Sohnrey and Holtz, 2005) [16], respectively in small ruminants. Arangasamy *et al*. (2018) [1] reported overall pregnancy rate of ranging from 7 to 79% in AI using frozen-thawed goat semen.

Conclusion

AI is a first generation tool for assisted reproductive technology which has potential for genetic improvement of goats reared in backyard system as quality bucks are sold at earlier ages by farmers for meat. As the pregnancy rate varies with technique used and size and breed of goat, therefore, it is recommended that the insemination protocol should be standardized according to size and breed of goat in the valley before its mass application in field.

Acknowledgment

The authors are thankful to Dr. Owais Ahmad (IAS), Worthy Deputy Commissioner Bandipora for providing funds for establishment of Frozen Semen Laboratory and Frozen Semen Bank under Aspirational Development Block Programme and Mr. Imtiyaz Ahmad, Joint Director Planning Bandipora for his valuable guidance and support.

References

1. Arangasamy A, Krishnaiah MV, Manohar N, Selvaraju S, Rani GP, Soren NM, *et al*. Cryoprotective role of organic Zn and Cu supplementation in goats (*Capra hircus*) diet. Cryobiology. 2018;81:117-124. DOI: 10.1016/j. cryobiol.2018.02.001.
2. Baldassarre H, Karatzas CN. Advanced assisted reproduction technologies (ART) in goats. Animal Reproduction Science. 2004;82-3:255-66. https://doi.org/10.1016/j.anireprosci.2004.04.027
3. Bogdan L, Groza I, Ciupe S, Neagu R, Tutulan C, Petrean A, *et al*. Research concerning es-trus induction and synchronization in anestrous (out of season) goats. Veterinary Medicine. 2008;65:91-95. https://doi.org/10.15835/buasvmcn-vm:65:2:1535.
4. Bowdridge EC, Knox WB, Whisnant CS, Farin CE. NCSync: Anovel, progestagen-free protocol for ovulation synchronisation and timed artificial insemination in goats. Small Ruminant Research. 2013;110:42-45
5. Dhara S, Thakur S, Sciences A, Sciences F. Artificial Insemination in Goat : A New Prospect for Scientific Goat Breeding Artificial Insemination in Goat : A New Prospect for Scientific Goat Breeding, (April); 2023. https://doi.org/10.48165/aru.2023.3.2.1
6. Evans G, Maxwell WMC. Frozen storage of semen. In: Salamon's Artificial Insemination of sheep and Goats. Butterworths, Wellington. 1987, 122-141.
7. Holtz W, Sohnrey B, Gerland M, Driancourt MA. Ovsynch synchronization and fixed-time insemination in goats. Theriogenology. 2008;69:785-792. https://doi.org/10.1016/j.theriogenol- ogy.2007.10.004
8. Leboeuf B, Restall B, Salamon S. Production and storage of goat semen for artificial insemination. Animal Reproduction Science. 2000;62:113-141. https://doi.org/10.1016/S0378-4320(00)00156-1
9. Nuti I. Current therapy in large animal theriogenology. In: Youngquist, R.S., Threlfall, W. R. (Eds.), 2nd ed. Saunders- Elsevier, St. Louis, MO. 2007, 529-534.

10. Parkinson T. Veterinary Reproduction and Obstetrics. In: Noakes, D.E., Parkinson, T.J., England, G.C.W. (Eds.), 9th ed. Saunders-Elsevier, London, UK; c2009. p. 681-806.
11. Pursley JR, Mee MO, Wiltbank MC. Synchronization of ovulation in dairy cows using PGF2α and GnRH. *Theriogenology*. 1995;44:915-923. https://doi.org/10.1016/0093- 691x(95)00279-h
12. Rana TS. Perspectives of changing nature of livestock resources in India. International Journal of Social Science and Economic Research. 2019;4(4):2930-2942.
13. Rather MA, Hamdani A, Ayaz A, Shanaz S, Mir SA, Nabi N. Morphological, phenotypic, performance traits of nondescript goats in Budgam district of Kashmir. Ruminant Science. 2020;8(2):137-140.
14. Shipley CFB, Buckrell BC, Mylne MJA. Current therapy in large animal. Theriogenology In: Youngquist, R.S., Threlfall, W.R. (Eds.), 2nd ed. Saunders Elsevier, St. Louis, MO; c2007. p. 629-641.
15. Smith JF. Artificial Insemination of Dairy Goats**.** Guide D-704. Publication Dairy; c2009. 1-2.
16. Sohnrey B, Holtz W. Transcervical deep corneal insemination of goats. Journal of Animal Science. 2005;83(7):1543-1548. doi:10.2527/2005.8371543x.
17. Yadav S, Yadav B, Anand M, Swain DK. Artificial insemination in goats- prospect and challenges. XXVII Annual Conference of Society of Animal Physiology of India; c2018. p. 21-25.
18. Zhao Y, Zhang J, Wei H, Sun X, Mu B, Yu M. Efficiency of methods applied for goat estrous synchronization in subtropical monsoonal climate zone of Southwest China. Tropical Animal Health Production. 2010;42:1257-1262. https://doi.org/10.1007/s11250-010-9558-6.
19. Branover A, Foley D, Steinman M. Amd fusion apu: Llano. Ieee Micro. 2012;32(2):28-37.