



Conception Rates after Cervical Insemination of Freshly Diluted Semen and Chilled Semen in Nellore Sheep (Jodipi)

P. Vishal Kumar, K. Veera bramhaiah, K. Mouli Krishna, B.Ekambaram, M.M. Rajesh and A. Ravi

Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science, Tirupati – 517502, AP, India.

Corresponding author: bramhaiahvet@yahoo.com

ABSTRACT

This study was undertaken to evaluate the conception rate in Nellore sheep (Jodipi) with fresh diluted semen and chilled semen at 24 and 48h (stored at 5°C). Semen was collected, diluted with Tris Citric acid Fructose Yolk diluent and stored at 5°C for 24 and 48h to undertake cervical artificial insemination in 63 ewes at natural estrus. Conception rates were 61.90, 47.62 and 42.86% with diluted semen and chilled semen stored for 24 and 48h, respectively based on 25 day non return rates. Therefore, it was concluded that Artificial Insemination with both freshly diluted semen and chilled semen stored up to 48 h can used with good conception rates.

Keywords: Sheep – Cervical insemination – Freshly diluted semen and chilled semen

Artificial insemination in sheep is in practise since a long period but the success of AI in sheep was not similar to that in cattle because of problems like tortuous cervix canal in ewe, lack of easy method for penetration of A.I gun through ewe cervix and lack of proper frozen technology for ram semen (Cseh *et al.*, 2012). In India, information on AI in sheep was lesser than in large animals due to enhanced emphasis on cattle research focus than on sheep (Morrell, 2011). Conception rates after intra cervical insemination with chilled semen were higher compared to frozen semen (doesn't exceeded 40%) (Salamon and Maxwell, 2000). Therefore

to understand the fertility rate in Nellore Jodipi ewes inseminated with diluted semen and chilled semen stored at 5°C for 24 and 48h present research work was undertaken.

Materials and Methods

The study was conducted at Livestock Research Station Palamaner by utilizing three healthy Nellore rams with good libido and maintained under semi-intensive system having similar environmental conditions and feeding patterns. Semen was collected from rams and sixty three multiparous ewes were inseminated by cervical insemination method. After semen collection, samples having good initial motility of more than 50% were diluted with tris fructose citric acid egg yolk (TCFY) diluent at the rate of 200×10^6 spermatozoa per dose. Later diluted semen was either used for immediately for insemination or chilled in refrigerator at 5°C for 24 or 48 h for insemination at detected estrus by the apronised rams. During insemination, ewes' hind legs were raised by an attendant and the perineum and vagina were cleaned thoroughly. Later, one end of sterile vaginal glass speculum (200 mm length, 1.8 mm thickness and 24 mm with outer diameter) (Fig. 1) was lubricated with paraffin liquid and inserted gently into vagina as far as possible to the entrance of the cervical opening. Then the semen sample of about 0.2 ml was inseminated into the cervix through pipette tip by pressing rubber bulb slowly (Fig. 2) and the hind limbs were lowered after few minutes. Conception rates were assessed based on 25 d non return rate. Non return rates were detected by using apronized rams and the animals those did not come to heat were considered as conceived.

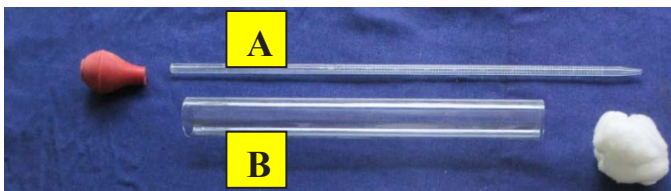


Figure 1. A. Graduated pipette with Rubber bulb; B. Glass Vaginal speculum for AI

Results and Discussions

Out of 21 ewes inseminated with TCFY diluted semen (0 h) 13 ewes did not return to estrus and the overall conception rate was 61.90%. While, among 21 ewes each inseminated with chilled semen stored for 24 and 48 h, ten and nine ewes, respectively did not return to estrus and the overall conception rates were 47.62 and 42.86%, respectively.



Figure 2. Cervical insemination of Nellore Jodipi ewe at detected estrus

Similar to the present study, Olesen (1993) also noticed satisfactory conception rates (65-75%). Higher conception rates obtained in this study with freshly diluted semen compared to chilled semen is akin to the findings of Maxwell and Salamon, (1993), O'Hara et al. (2010) and Lopez-Perez and Perez-Clariget, (2012) which might be due to the impaired sperm transport, viability and increased embryonic mortality up on storage of semen at 5°C for 48 h. Robertson and Watson (1987), Maxwell and Salamon, (1993) and Salamon and Maxwell, (2000) also opined that fertility of ram spermatozoa falls very markedly within first 12-24 h of storage as is noticed in this study and also attributed this to the reduction in motility and morphological integrity of spermatozoa.

At 24 h chilled storage of ram semen conception results were 47.62%. Similar results were also obtained by O'Hara et al. (2010) who reported the fertility percentage about 45 - 50, 25 - 30 and 15 - 20 after cervical insemination of semen stored for 24, 48 and 72 h, respectively with a overall lambing rate of 65-70%. Pervage et al. (2009) reported that the average conception rate percentage was 63.61, 61.90, 52.38 and 47.61 with sperm stored for zero, 1, 2, and 3 d, respectively at 5°C. Fernandez-Abella et al. (2003) reported that the pregnancy rates and lambing rates in adult merino ewes were 37.8 (ranging between 24 and 52) and 31 % (ranging between 20 and 44), respectively by cervical insemination

of chilled semen stored at 5°C for 24 h having 150×10^9 spermatozoa per dose. Paulenz *et al.* (2003) obtained 52.3 % NR return rate by using ram semen diluted in Tris- based extender stored at 5°C <12 h and also indicated that the 25d NR rate is one of the reliable measures for fertility estimate. But, Olivera-Muzante *et al.* (2011a) reported that 21 day NR may be used as an indicator for measuring fertility results in ewes. Anderson (1999) recorded that the difference between 25 d non return rate and lambing rate was 2.2 % in sheep inseminated with diluted fresh semen. Olivera-muzante *et al.* (2011a) reported that NR rates and fertility rates with cervical timed AI with fresh semen were about 51-61 and 26-48%, respectively in Australian merino ewes at the dose rate of 0.2 ml per ewe with concentration of about 750×10^9 spermatozoa/ml within 2 h after collection.

Conclusion

The ram semen diluted with TCFY dilutor and stored at 5°C up to 48 h has obtained satisfactory conception rates after cervical insemination indicating that Nellore ram spermatozoa could maintain the fertilizing potential in TCFY dilutor up to 48 h of storage period at 5°C.

Referemces

- Anderson Berg K 1999 Artificial insemination in sheep in Norway. Proc. Cent. Reprod: Spec. Symp. In : Soderquist L, Forsberg M, Rodriquez-Martinez M (Editors) Aspects of Ovine reproduction, Swedish University of Agricultural Sciences, Uppsala, Sweden : CRB Report 8 pp. 35-44.
- Cseh S, Faig L V and Amridis G S 2012 Semen processing and artificial insemination in health management of small ruminants. *Animal Reproduction Science* **130**:187-192.
- Fernandez-Abella D, Preve M O and Villegas N 2003 Insemination time and dilution rate of cooled and chilled ram semen affects fertility. *Theriogenology* **60**:21-26.
- Lopez-Perez A and Perez-Clariget R 2012 Ram seminal plasma improves pregnancy rates in ewes cervically inseminated with ram semen stored at 5°C for 24h. *Theriogenology* **77**:395-399.
- Maxwell M C and Salamon S 1993 Liquid storage of ram semen : a review. *Reproduction, Fertility and Development* **5**: 613-638.
- Morrell Jane M 2011 Artificial Insemination: Current and Future Trends. *Swedish University of Agricultural Sciences, Uppsala, Sweden, pp 8-9.*
- O'Hara L, Hanrahan J P, Richardson L, Donovan A, Fair S, Evans A C O, Lonergan P 2010 Effect of storage duration storage temperature, and diluents on the viability and fertility of fresh ram semen. *Theriogenology* **73**:541-549.

- Olesen I 1993 Effects of cervical insemination with frozen semen on fertility and litter size of Norwegian sheep. *Livestock Production Science* **37**:169-184.
- Olivera-Mujante J, Fierro S, Lopez V and Gil J 2011a Comparison of prostaglandin – and progesterone based protocols for timed artificial insemination. *Theriogenology* **75**:1232-1238.
- Paulenz H , Soderquist L, Adony T, Fossen O H and Anderson B K 2003 Effect of milk and TRIS-based extenders on the fertility of sheep inseminated vaginally once or twice with liquid ram semen. *Theriogenology* **60**:759-766.
- Pervage S, Hassan M R, Ershaduzzaman M and Khandoker M A M Y 2009 Preservation of liquid semen and artificial insemination in native sheep. *Journal of Bangladesh Agricultural University* **7**(2): 305-308.
- Robertson I and Watson P F 1987 The effect of egg yolk on the control of intracellular calcium in ram spermatozoa cooled and stored at 5°C. *Animal Reproduction Science* **15**:177-187.
- Salamon S and Maxwell W M C 2000 Storage of ram semen. *Animal Reproduction Science* **62**: 77 – 111.

