

Use of Embryo Transfer for the Preservation of Small Ruminants in Risk of Extinction

Edilson Soares Lopes Júnior¹ & Vicente José de Figueirêdo Freitas²

Background: For about 9000 years, farmers have been managing sheep and goats in a sustainable way. From the 1800's the situation started to change dramatically, with the rise of the concept of breed. With the development of industrial breeds came economic pressure on farmers to abandon their traditional breeds. This means that genetic resources in sheep and goats are highly endangered. It is therefore important to take measures that promote a sustainable management of these genetic resources; first, by in situ preservation of endangered breeds; second, by using modern reproductive techniques, particularly the embryo transfer to restore the genetic diversity of breeds. The objective of this paper is to present the results obtained with indigenous breeds of small ruminants, raised in the Northeastern Brazil, which are with a reduced number of individuals.

Review: Small ruminant production in Northeastern Brazil is of great socio-economic importance to the region. Among others, this activity stands out regarding the size of the herds. That herd is made up of undefined breeds together with imported breeds of high production levels and the indigenous breeds that are highly adapted to the region's prevailing semi-arid conditions. The indigenous breeds play an important role in subsistence stock farming, although the uncontrolled crossbreeding of these breeds with exotic breeds has caused genetic degeneration, placing the indigenous breeds at risk of extinction. The main examples of this condition are Canindé and Moxotó (goats) and Morada Nova var. white (sheep) breeds. Modern reproductive techniques, such as artificial insemination (AI), multiple ovulation/embryo transfer (MOET) and in vitro embryo production (IVEP) have exhibited great potential to preserve endangered breeds. Our group used these techniques, especially the MOET, in order to form an embryo bank of these indigenous breeds. Estrus synchronization was performed using vaginal sponge containing 60 mg MAP inserted for 11 (goats) or 14 (sheep) days. Forty-eight hours prior to progestagen removal, superovulatory treatment was started. Females received injections of pFSH at 12h intervals in decreasing doses. The sponges were removed at the time of the fifth pFSH injection. In goats, cloprostenol injection was used at the same time of the first pFSH injection. The natural mating or AI was performed at the onset of estrus and 24h later and the embryo recovery at six (sheep) or seven (goats) days after estrus. Two methods of embryo recovery are used: laparotomy or surgical (sheep and goats) and transcervical or non surgical (goats) and the embryo transfer was performed by semi-laparoscopy in synchronized recipients. The non transferred embryos were cryopreserved by slow freezing. The ovulation rate varied widely, which is a major problem in the process as a whole. However, the use of nonsurgical technique in goats was very interesting, resulting in a recovery rate greater than 80%. In sheep, it was observed an effect of age of donor, because young animals (< 2 years), when compared to those older (3-4 years), showed a higher ovulation rate (10.2 ± 1.2 vs 5.0 ± 0.8 , $P < 0.05$).

Conclusion: Indigenous breeds of small ruminants responded satisfactorily to the MOET procedure, which leaves an excellent perspective of its use in preservation of these breeds. In addition, the embryo recovery by transcervical way will greatly improve the MOET procedure, since the same donor can be used several times without the inconvenience of the occurrence of postoperative adhesions.

Keywords: goat, sheep, endangered, embryo transfer.

¹Universidade Federal do Vale do São Francisco (UNIVASF), Petrolina, PE, Brazil. ²Faculdade de Veterinária, Universidade Estadual do Ceará (UECE). V.J.F. Freitas [vjff@pq.cnpq.br. - Fax: +55 (85) 3101-9840]. Av. Dedé Brasil n. 1700. Fortaleza CEP 60.740-903 Fortaleza, CE, Brazil.