Advantages and Disadvantages of Embryo Transfer and Artificial Insemination in Camelids

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Artificial insemination (AI) and embryo transfer (ET) are considered the reproductive technologies that had the most impact on genetic improvement in all production animals. Both techniques offer several advantages as well as disadvantages if not conducted correctly. The objective of this presentation is to discuss the advantages of these techniques and raise awareness about their disadvantages so that breeders and breeder associations can have a constructive debate about adopting the techniques for large scale production schemes.

Advantages of AI and ET are similar and can be grouped in three general categories; genetic, health and economic advantages. AI can have a great impact on the dissemination of desirable genes from superior males and reduce the cost associated with shipping of females to breeding farms. This also will improve biosecurity and limit the risk for transmission of diseases from farm to farm if semen is processed according to set health standards. In addition, semen preservation allows importation of genetics at a reduced cost and with less quarantine problems than importation of live animals. ET would offer the same genetic advantages on the female side. It allows a tremendous shortening of the generation interval considering the slow maturity and the long interval between birthing in these species. This technique can also be used as a method to maintain superior females in production that may have acquired pathologies that reduce their ability to maintain a pregnancy to term. These two techniques combined with more advanced reproductive technologies such as in vitro fertilization, intracytoplasmic injection and cloning can offer additional genetic improvement and fundamental sciences discoveries that will add to our knowledge of various aspects of the biology of these species.

Disadvantages of AI and ET fall in the same categories as their advantages. From the genetics point of view, questions will arise about the risk of reducing the gene pool by focusing on a few superior individuals. It is important to also note that pregnancy rate may be less than that expected in natural mating. Regulatory aspects will need to be developed as to what health requirements should be established for semen and embryo donors in order to avoid venereal transmission of disease. Finally from the economics aspects, value of animals may be reduced, particularly if the number of offspring is not regulated.

Other important aspects that should be addressed concern ethical and animal welfare issues. Interspecific ET, genetic testing and gender selection before transfer, use of poor fertility animals, superovulation effects on the female and animal suffering if the techniques are used by untrained persons, are just a few of the aspects that should be considered in drafting any recommendations for the use of these biotechnologies