Achievements and unmet promises of assisted reproduction technologies in large animals: a personal perspective

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Abstract

This paper gives an overview of assisted reproductive technologies (ART) in livestock species coming from the author's direct experience and contribution to the development of several of them. The assessment is conducted on the basis of the progress achieved since the early eighties and the impact on the clinical/practical use of such procedures. Artificial insemination (AI) is still the leading technology used on a large scale in livestock with most favourable cost-benefit ratio. All the other ARTs have niche applications compared to AI. Significant progress has been achieved in embryo culture, somatic cell nuclear transfer and on the identification of the many unknown variables affecting the success rate, while in areas such as superovulation, oocyte maturation, IVF, embryonic stem cells and cryopreservation progress has been limited or absent. It is the opinion of the author that ARTs have reached a plateau whereby only minimal improvement of efficiency can be achieved. Significant advances can only come from major breakthrough in the understanding of the underlying biological mechanisms.

Keywords

large animals, oocytes, embryos, stem cells, SCNT.

References


Animal Assisted Therapy (AAT) is the use of animal interactions with patients to aid recovery from health problems or to help people cope with certain medical conditions. Those medical providers and therapists who support AAT believe it has many benefits such as helping with personal and social development, increased self-esteem, improved mental health, better social skills, and increased empathy and nurturing skills. Some forms of AAT involve caring for animals, such as feeding, grooming, and bathing the animals, on a regular basis. Other forms of AAT include an animal being


Assisted Reproductive Technologies (ART) refers collectively to the various procedures and techniques involving the laboratory handling of human or animals' sperm, oocytes and/or embryos such as IVF, GIFT, ZIFT/TET, cryopreservation/vitrification, ICSI, … etc. Different techniques have been suggested and performed to overcome severe infertility either in male or female, moreover, postpartum infertility which is usually observed in high yielding dairy cows, and to increase the rate of genetic selection in high genetic merit individuals. Such techniques are varied to be as simple as artificial reproduction.

Artificial reproduction is the biological process by which organisms give birth or give rise to a new organism. This process is seen in all living organisms—both plants and animals. This type of reproduction is seen in both plants and animals but is more common in plants than in animals. Apart from these two types of reproduction methods, there are artificial modes of reproduction that have evolved due to advances in medicine. Solved Example for You. Question: What is the female reproductive organ in a flowering plant known as?