Sexing of Cattle Embryos a Reality

Alta Embryo Group Ltd. first started its research into embryo sexing in 1989. By 1992, a commercial procedure was being offered to our clients. This was a major advance in particular for the dairy industry, where bull calves are wanted only from the very top end of the breed.

The major difference between a male and a female embryo is that the cells of the male contain an X and a Y chromosome, whereas the female cells contain two X chromosomes. The secret to determining sex then becomes the ability to determine if a Y chromosome is present.

Researchers in the Department of Medical Biochemistry of the University of Calgary, working in conjunction with Alta Embryo Group, were able to isolate a specific sequence of chemicals found only on the Y chromosome. Through a procedure called the polymerase chain reaction, the DNA of embryonic cells can be analyzed for the presence of this sequence. When present, it can be multiplied over a million times. Once this replication has been completed a simple test indicates whether the male DNA is present.

The procedure involves removing a few cells (biopsy) from the early embryo. These cells are analyzed and whatever their sex, the remaining embryo must be the same. Typically, a donor is brought to Alta Embryo Group early in the morning (9:00 AM) and the sexes of the embryos are known by 3:00 PM, when the transfers are done. Biopsied embryos can also be frozen.

Until June 1992, the sexing procedure was carried out at the University of Calgary, but at that time the laboratory was moved to Alta Embryo Group, where the complete procedure is now carried out. The initial commercialization started in September 1992. The fee to sex an embryo is saved in transfer costs alone, since only half the number of transfers will be performed where calves of a specific sex are wanted.

Results to date have been very encouraging. Over 6000 embryos have been subjected to analysis and sex has been identified over 90% of the time. There are instances where the sex is not determined (<10%). Through the use of fetal sexing by ultrasound, the reliability of this test for sexing embryos has been confirmed. The right sex is assigned to an embryo about 95% of the time.

Pregnancy rates following biopsy of embryos are reasonable. With transfer of fresh sexed embryos, the pregnancy rates exceed 60%. If embryos are frozen after biopsy, the pregnancy rate drops to about 50% following transfer. Combined with direct transfer, producers can now transfer sexed embryos into their own recipients.

For further information please contact:

Alta Embryo Group Ltd.
Site 12, Box 105, R.R. 4, Calgary, AB, T2M 4L4
Tel: (403) 239-8882 Fax: (403) 241-4524
Email: aeg@altagenetics.com