

ABSOLUTE GENETICS -Superior Bovine Reproduction

Absolute Genetics (Pty) Ltd is based in Bloemfontein, South Africa. It is a registered import and export facility for Bovine (cattle) genetics in South Africa.

Embryos for Exports

Embryos are an efficient, cost effective and safe way to move genetics throughout the world. Thanks to cutting edge research, embryos that are processed according to the International Embryo Transfer Society (IETS) standards by certified and accredited practitioners can be exported to various countries across the world. IETS washed embryos pose zero risk for the transmission of any known disease, including BSE and Foot and Mouth. The washing of embryos with outer shells (zona pellucida) that are intact with an enzyme called trypsin, removes any potential viral and/or bacterial agents. Only embryos that are processed in approved laboratories by embryo transfer practitioners that are certified and approved can be exported. To maintain export status, the embryos must be stored under the direct supervision of an approved embryo transfer practitioner.

Embryos to be exported to a specific market will be produced by a certified embryo transfer practitioner according to the specific requirements of such a market regarding donor testing and special semen qualifications.

**Source: ramsem.com/embryo-export
Partners to Absolute Genetics regarding semen collection.**

In Vivo Embryo Flushing

In Vivo Embryo Flushing is the process where embryos are flushed from the donor cow and transferred into a surrogate, where the embryo develops into a foetus and grows until calving. The surrogate, or recipient mother, raises the calve as her own until weaning.

With embryo flushing the donor cow undergoes a synchronization program, where follicle stimulating hormone (FSH) is injected to ensure superovulation of oocytes (egg cells). The donor is then artificially inseminated to fertilize the multiple oocytes. Six to seven days after insemination, the embryos are recovered through a non-surgical procedure, called embryo flushing

After embryo flushing the embryos undergo quality control to check the structure and are classified as grade 1, 2, 3, degenerate or unfertilized (oocytes). The grade 1-3

embryos are selected for fresh transfer or alternatively cryopreserved (frozen) to be used at a later stage. Degenerates and oocytes are discarded. In case of exports, only grade one embryos are selected and stored until shipment. Grade 2 and 3 embryos can be frozen for the farmer to use but have the best chance with fresh transfer.

Advantages to embryo flushing

- A genetic superior cow can produce more calves yearly.
- The fastest, most cost-effective way to expand and preserve cow genetics.
- Increase top genetics in your breed or herd.
- Genetics can be shared between countries more easily.
- Live animals are transported less, which reduces the risk of disease transmissions
- Reduce risk in the sense of genetic preservation of top genetics.

This procedure can be repeated again after 4-6 weeks, with two total flushing preferred whereupon the donor is made pregnant again.

Bovine Embryo Transfer

Bovine embryo transfer occurs after embryo production, either through embryo flushing or in vitro fertilization (IVF). An embryo produced is transferred into the uterus of the recipient or surrogate cow where the embryo develops to a foetus and at calving the recipient will raise the calf until weaning. Embryo Transfer is seen as the aim of all assisted reproduction techniques (ART) and the advantages of embryo transfers outweighs the disadvantages

Advantages to Embryo Transfer

- More calves can be produced from a genetic superior cow yearly.
- An animal of lower genetic potential can still be utilized for genetic progress (as recipient).
- Increased rate of genetics progress.
- It allows breeders to produce calves that sell for better prices (E.g. more profitable weaner production).

The high cost of embryo production and transfer is the main disadvantage. The effect of time lost with embryo flushing is taken into account by breeder societies when calculating inter calve period.

With the process of embryo transfer, the recipient cows are synchronised to be ready for embryo transfer on a specific day. This synchronisation is often scheduled to be on the same day as embryo flushing, so that fresh flushed embryos can be transferred. Fresh embryos have a conception rate of 50%, on average, with frozen (cryopreserved) thawed embryos on 40% conception rate.

Factors effecting the success rate of embryo transfer

- **Fertility** – it is important to select fertile animals as recipients. Animals that show activity, cycle regularly and had no trouble getting pregnant previously. Recipient prepared more than two times are discouraged.
- **Age** – the age of the recipient plays a role, with a cow that calved more than three time being the best and heifers, at breeding age, as second option for embryo recipients. Females that has calved only once, is naturally more difficult to get pregnant again and not preferred to be prepared as embryo recipients.
- **Breed** – the breed factors can include factors like adaptability and temperament, but also the size. It is important that the recipients used are the appropriate size for the embryos that they will carry to term. This is to ensure easy calving. It is also important that the recipients used is adapted to the feed, the environment, the farm and even to handling. Animals that are not used to handling, are more likely to stress. Any kind of stress has a negative effect on embryo success. Some breeds are more temperamental, which is also a stress indicator.
- **Body condition score (BCS)** – body condition is scored from a 1 to 5, with 1 being lowest and 5 the highest. It is important to score the body condition so that feeding can be adapted to get the group in optimal condition. Recipients should be in a rising condition state at transfer to ensure optimal conception rates. Moving from 2.5 to a score of 3 is preferred.
- **Post-partum** – recipients without calves are the best, but often not available and therefore it is suggested that animals be used as embryo recipients at 80 days post calving.
- **Facilities** – handling facilities is preferred to be neat and enable easy handling on the day of embryo transfer to ensure less stress on the recipients.
- **Environment** – the weather has a major effect on embryo survival as thunderstorms, cold, extreme temperature and rain causes stress on the animals. If cover is available during cold or rain it is suggested to use is. Feed can be increased during colder, wetter weather since the body increases metabolic heat production to sustain a constant body temperature and in contrary reduces nutrients available for reproduction. Cooling options during extreme temperatures can also be used where possible.
- **Season** – it is best to do embryo transfer during natural mating season. This is often not possible and breeding objectives differ between farmers; therefore we only discourage embryo transfer in mid-winter and -summer.
- **Management** – not only is management of the synchronisation vital, but it is also important to manage the group of recipients properly after embryo transfer. Managing factors that can cause stress, like changing of feed or moving the animals from one area to the next. Only 50%, on average, of animals prepared are used during embryo transfer. Therefor we suggest preparing two animals per embryo available. After two synchronisations we suggest artificial insemination or putting the unused females to the bull.

Embryo transfers are either performed by the Absolute Genetics' Veterinarian or under his/her guidance.

SOURCE: www.absolutegenetics.co.za