

# REPRO TRACKS



by Cliff Lamb, Texas A&M University

## Success in an ET program

*The primary use of embryo transfer (ET) in cattle has been to amplify reproductive rates of valuable females. ET is especially useful with cattle because of their relatively low reproductive rate and long generation interval when compared to other livestock species.*

The success of ET depends on factors associated with the embryo, the recipient or an interaction between both. Once transferable embryos are collected from a donor cow, a decision is made as to which of the available recipients should receive embryos to achieve the greatest number of pregnancies.

In many ways, management of the donor and recipient is critical to ensure the success of an ET program. Efficient donors are expected to produce good quality embryos and the recipients must be able to conceive to the transferred embryo, maintain the pregnancy, calve without assistance and raise a calf of high genetic merit.

### Nutritional considerations

Many factors may influence how donors respond to superstimulation and generate a high number of fertilized good-to-excellent quality embryos. Outside of genetics, nutrition is likely the single greatest factor influencing the response of donor and recipient cows. It is important to ensure cows are maintained on a positive plane of nutrition and fed a diet meeting maintenance requirements.

Insufficient intake of energy,

protein, vitamins, and micro- and macrominerals has been associated with suboptimal reproductive performance. Many managers of ET programs spend a significant amount of time and money focusing on seeking the nutritional “silver bullet” to enhance their success rates. However, of these nutritional effects on reproduction, energy balance is likely the single most important nutritional factor related to poor reproductive function in cattle.

Body condition scoring (BCS) is a reliable method to assess the nutritional status of recipients. Donor and recipient managers should understand when cows can be maintained on a decreasing plane of nutrition, when they should be maintained on an increasing plane of nutrition, or when they can be kept on a maintenance diet. Understanding the production cycle of the cow and how to manipulate the diet will improve the ability of the recipients to conceive to the transferred embryo.

### Recipients synchronization

The most useful alternative to increasing the number of animals receiving embryos is to utilize protocols allowing ET without the

need for heat detection, usually called fixed-time embryo transfer (FTET) protocols. However, much of the research related to the systems currently used in ET programs were developed for fixed-time artificial insemination (TAI) rather than FTET.

Transfer of embryos into estrous synchronized cows has been most effective when embryos were transferred 6 to 8 days after a recipient is detected in estrus or induced to ovulate. A detailed version of current estrus synchronization and TAI protocols is reviewed annually by the Beef Reproduction Task Force (BRTF) at <https://beefrepro.unl.edu>. Utilizing a similar protocol on recipients using FTET is practical and effective in yielding high pregnancy rates in recipients.

### General recipient considerations

Selection and identification of high-quality recipients is not simple. Many prefer the use of virgin heifers, whereas others choose cows with a known history of high fertility. When heifers are to be used for recipients, the selection criteria should be the same as for high-quality replacement heifers. They need to be cycling, which can be assessed indirectly by

## STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

using reproductive tract scores; on a high plane of nutrition; have an adequately-sized, normally shaped, pelvic canal and no history of receiving growth implants.

Lactating recipients have an advantage of a known reproductive history. Recipients that carry an ET calf to term but do not raise a normal calf to weaning should be re-evaluated as a recipient prospect. Similarly, open cows with an unknown reproductive history need to be carefully examined prior to inclusion in a recipient herd or program.

The reproductive tract needs to be thoroughly examined via rectal palpation or trans-rectal ultrasonography for pregnancy, uterine anomalies such as fluid or fetal remnants or evidence of metritis or endometritis, and the ovaries examined for normal follicular or luteal structures. In addition, recipients should have healthy teeth and eyes, a good udder, be younger than 8 years of age and be structurally sound. Also, management practices minimizing stress have the highest fertility rates.

For ET to be effective, numerous factors need to be put in place to ensure success. Nutrition, estrous cycle control, as well as donor and recipient management, are all responsible for the success or failure in a given program. Therefore, the producers, embryologists, veterinarians and all members of the herd management team need to be aware of the short- and long-term factors contributing to a successful ET program. These factors also include ensuring facilities minimize stress and the herd health program is well-defined and executed.

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