

Prepping for ET Success

Donor and recipient management should optimize success of embryo transfer.

Story & photo by **Troy Smith**, field editor

‘Embryo transfer (ET) sometimes seems to rely on witchcraft,’ joked bovine

reproduction specialist Cliff Lamb, explaining that too many of its practitioners seem to constantly tinker with their procedure. They’re always seeking some new “trick” that will improve success rates. Too often, the program changes have little or no basis in science.

“Be careful about looking for a silver bullet,”

Lamb warned at the Applied Reproductive Strategies in Beef Cattle symposium last fall. “Consistency,” he added, “really is the key to success with embryo transfer.”

According to Lamb, who became head of the Department of Animal Science at Texas A&M University March 1, the factors responsible for the success or failure with ET include nutrition, control of the estrous cycle, and management of donor and recipient females. Lamb called donor and recipient management critical, since donors are expected to produce good-quality embryos and recipients must be able to conceive the transferred embryo, maintain the pregnancy until full term, calve without assistance, and raise a calf of high genetic merit.

While important to both donors and recipients, Lamb counts nutrition as the single greatest factor influencing donor cow response to superstimulation. Accordingly, it is important that donors be maintained on a positive plane of nutrition. However, Lamb does not advocate for popular dogma calling supplementation of donor cow diets with mineral from only organic sources. He discounted the notion that feeding organic mineral during the period prior to superovulation will enhance both the quality and number of embryos.

“As long as the animal’s mineral requirements are met, the mineral’s source (organic vs. inorganic) probably makes minimal difference,” stated Lamb.

While discussing management of cows that are to be ET recipients, Lamb said a useful method of increasing the number of animals receiving embryos is to utilize protocols that allow for ET without the need for detection of estrus.



Cliff Lamb

“I refer you to the protocol sheets for fixed-time AI (artificial insemination).

They should work,” said Lamb, referring to the protocols recommended by the Beef Reproduction Task Force available at <http://beefrepro.unl.edu/resources.html>. “However, the single most utilized protocol in the U.S. is the 7-day CO-synch system.”

Lamb commented on the practice of administering human chorionic gonadotropin (hCG) at the time of ET. Citing related studies, he said use of hCG has been shown to increase pregnancy rates by about 6%. Lamb warned, however, that enhancement of pregnancy rates does not occur in every case. Generally, nutritionally compromised,

thin cows appear to benefit, while well-conditioned cows do not.

Reiterating the influence of nutritional status, this time for recipient females, Lamb emphasized the importance of having recipients on an increasing plane of nutrition.

“It’s not all about BCS (body condition score) on the day of transfer,” explained Lamb. “I’d rather have a recipient at BCS 4 and increasing than have her at BCS 5, fallen from 6 and declining.”



Editor’s Note: Lamb and Mark Allen (see “Opportunities abound for genetic and reproductive progress”) spoke during the 2016 ARSBC. Visit the archived 2016 Newsroom at www.appliedreprostrategies.com to view their PowerPoints, read the proceedings or listen to the presentations. Compiled by the Angus Media editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force.

Opportunities abound for genetic, reproductive progress

The future is bright for reproductive and genetic progress in the beef cattle industry, said Mark Allen, director of genetic technology for Trans Ova Genetics, Sioux Center, Iowa.



Mark Allen

PHOTO BY TROY SMITH

Selection processes have evolved considerably from simple visual appraisal, and while impressive progress has already been made, more opportunities exist.

Allen addressed more than 200 attendees of the Applied Reproductive Strategies in Beef Cattle symposium in Des Moines, Iowa, last fall.

The formula for genetic gain equals accuracy times genetic variation times selection intensity divided by the generation interval. In the denominator-heavy equation, generation interval has the most potential to improve, he said, adding that it is the industry’s job to harness that potential.

Reproduction is a complex multi-component trait, and Allen pointed out there are many places where something can go wrong. Cattlemen need to harness

more reproductive data, he said, to improve it.

The beef industry has a large toolbox of reproductive tools, including artificial insemination (AI), embryo transfer (ET), *in vitro* fertilization (IVF), sexed semen, recipient solutions, genetic resources, viagen technology and even precision breeding in which genes can be edited.

He noted that ET and IVF have the most potential to reduce generation intervals, and shared data in which they have been successfully used in the dairy industry. Elite females can have oocytes collected as early as 7 months old, and can also be collected while pregnant, so genetic advances hasten. In Holsteins, parent ages are going down, but accuracy is going up.

For the beef industry, Allen highlighted that genomic technology is helping increase accuracy. Genomic tests increase data accuracy equivalent to many progeny proofs. However, the dairy industry is better at leveraging commercial data. Allen suggested the beef industry do the same. Collecting data on reproductive traits will further reproductive advancement for the beef industry.

— by **Kasey Brown**, special projects editor