



Repro Tracks

► by **Bill Beal**, beef cattle reproductive physiologist, Virginia Tech

Good recipcs and tight synchrony

Effective embryo transfer (ET) programs depend on the selection of fertile embryo recipients with excellent maternal traits. The estrous cycles of those recipients also must be synchronized with that of the donor to maximize pregnancy rates. Making wise decisions on recipient selection and estrus synchronization methods are keys to the success of an ET program.

Breeder question #1

I started buying donor cows a couple of years ago, and now I need more recipient females. Currently, I use some of my lower-end registered cows as recipients, but I need to expand and was wondering if you had any tips about selecting recipients? I know moderate-framed, 3-year-old cows with good udders, milk and structural soundness would define a good recipient, but I was wondering if you have had the best luck with Angus recipient cows or if a crossbred would provide heterosis and be the best way to go?

Response: Most of us spend a great deal of time worrying about donors for an ET program and too little time worrying about recipients. Maintaining recipcs is the biggest cost in an ET program, and the recipient pregnancy rate makes or breaks the deal. Therefore, your questions about picking recipcs are good ones.

You have defined the “perfect” recipient cow — a 3-year-old (already calved, unlikely to experience dystocia and likely to breed back), a good milker (differences in milk production account for 70% of the variation in ET calves), with udder quality and structural soundness. The problem is finding someone willing to sell you those cows at a price you can afford. The only way I have found to effectively purchase good recipient cows is to buy pregnant cows after

their calves from the previous year have been weaned, to calve those cows out and then use them as ET recipients rather than rebreeding them. This allows you to purchase them cheaper than if you bought them as pairs with calves at side. It also allows you to feed to the body condition you prefer at calving. When you wean and sell the feeder calf the recip raises, you also recoup some of your cow costs. The biggest problem with this scenario is that it requires a lot of planning.

It is usually easier and quicker to find groups of weaned heifer calves or yearlings that can be developed for use as recipcs. There are some advantages to this, including a lower biosecurity risk and the opportunity to devise prebreeding health and nutrition programs. The downside of using heifers as recipcs is the risk of dystocia, lower milk production and the challenge of getting a first-calf heifer to cycle quickly after calving. In addition, we have found virgin heifers used as recipients at Virginia Tech to have had a 10% lower pregnancy rate than cows. Nonetheless, we have been forced to develop several hundred heifers to be used as recipients and have done so with some success.

After trying straight-Angus and crossbred recipients, I would prefer recipient cows or heifers that are crossbred. We have had

success with Angus × Hereford, Angus × Gelbvieh and Angus × Simmental crossbreds. I have not found the pregnancy rates of crossbreds to be higher after receiving an embryo, but our recipient crossbred heifers have exhibited more maternal behavior; they have returned to estrus quickly after calving and, in the case of the Gelbvieh- and Simmental-crosses, they have had more milk than the straight-Angus recipient first-calf heifers. These advantages are most apparent with their first calf. By the time they deliver and raise their second ET calf, the advantages of the crossbred recipcs aren’t as obvious.

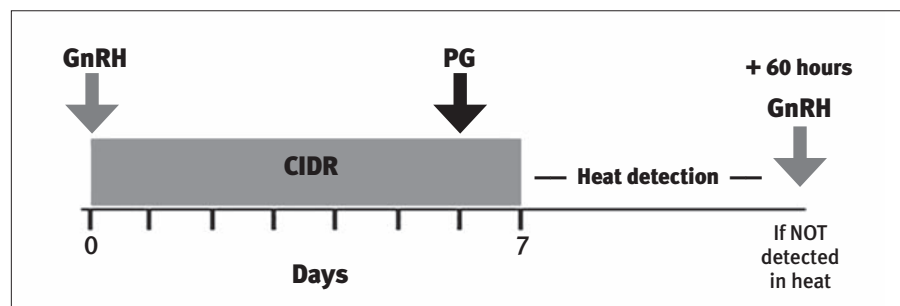
One exception to the recommendation of using crossbred commercial recipients would be if registered Angus recipients are available. Birth, weaning and yearling weight data for ET calves raised by registered Angus recipient cows or heifers, in a contemporary group of ET calves also raised by registered Angus recipients, can be used to calculate performance ratios and interim expected progeny differences (EPDs). In some cases this may allow the ET calves to have interim EPDs calculated where they might not be available if the recipient dam were a commercial cow and the calf’s performance data could not be used.

Breeder question #2

The ET practitioner I use has to travel a long distance to my farm. Having him come to transfer embryos on more than one day or having him stay overnight is very costly. I need to get as many recipients in heat on the same day as possible. What estrus synchronization method would you recommend for my recipients?

Response: The “tightness” of synchrony to an estrus synchronization treatment is the term used to describe how many cows or heifers can be synchronized in a short period. Tight synchrony in a group of ET recipients is especially important when frozen embryos collected from donors seven days after estrus must be transferred to the recipients at one time as you described. Ideally, transfers need to be made seven days (± 12 hours) after the recipient is detected in heat. Therefore, synchronizing the estrus of recipients to occur within a 24-hour period is preferred. The ET practitioner can be scheduled to come to the farm seven days

Fig. 1: Modified Co-Synch + CIDR method of estrus synchronization



after the middle of that period, and synchrony between the embryo and recipients should be ideal.

The synchronization method providing the tightest synchrony of estrus of recipients in our ET program has been a modification of the Co-Synch + CIDR® protocol (see Fig. 1). All recipients receive an injection of gonadotropin-releasing hormone (GnRH) at the time a CIDR is placed in the vagina. The CIDR is left in place for seven days, but 24 hours before the CIDR is removed, each recipient is injected with prostaglandin (PG). Injecting PG one day before removing the CIDR is very important for achieving a tighter synchrony of estrus.

Using this protocol on recipient cows with calves at side results in most of the recipients being in heat between 36 and 60 hours after removal of the CIDR. Any recipient not detected in heat by 60 hours after CIDR removal receives a second injection of GnRH to induce ovulation, and she is considered to have been in heat at the time of the GnRH injection. The ET practitioner is scheduled to arrive eight days after the CIDR removal to transfer embryos. All recipients have had a heat (or have been induced to ovulate) within a 24-hour period.

Embryos with different stages of development are assigned to recipients based on the time of heat detection or the time of the second GnRH injection. If you use this method, you should be able to get all embryos transferred on the same day and maximize the synchrony between the embryos and the recipients.



Editor's Note: Bill Beal is a beef cattle reproductive physiologist at Virginia Tech. He conducts research involving estrus synchronization, artificial insemination, ET and the use of ultrasound technology. This column is designed to provide answers to questions about reproductive management commonly posed by commercial and purebred breeders. If you have questions or comments related to the reproductive management of cows or bulls, e-mail them to Beal at wbeal@vt.edu or mail them to him at the Dept. of Animal & Poultry Sciences, Virginia Tech, Blacksburg, VA 24061-0306.