



Repro Tracks

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

Troubleshooting AI and ET programs

Artificial insemination (AI) and embryo transfer (ET) programs are the most powerful tools Angus breeders have to enhance the rate of genetic improvement. However, achieving maximum pregnancy rates with AI or ET can be an elusive goal. The best approach to improvement is to collect data and perform an honest evaluation of the breeding program.

Breeder's question:

I just finished my spring breeding season. I synchronized and bred 16 cows by AI after detecting them in heat. I got nine of 16 pregnant on the first insemination. However, I have rebred each of the seven cows that failed to conceive two more times after detection of natural heats, and none of the cows are pregnant. How can I figure out what's wrong?

Response:

Your original AI conception rate at 9-to-16, or 56%, is within the normal range of what would be expected with good heat detection, good semen and good AI technique. Especially since, as you indicated in your e-mail, the cows were holdovers from your fall-calving herd that didn't get bred when inseminated in December and January.

Going zero for 14 on two repeat heats from each of the seven cows open after the first AI is troubling. It is particularly troubling because a normal percentage became pregnant after the first service, and they showed solid heats with estrous cycles of normal lengths (18-24 days). It is possible that these seven cows are problem breeders, and their poor reproductive performance is indicative of a problem with each animal. However, before you blame the cows, you want to be sure something else didn't go wrong.

A little detective work will allow you to eliminate at least one possible cause of the poor rebreeding results. First, I would suggest that you begin by checking the semen used to breed the repeat breeder cows. Since none of the cows became pregnant after rebreeding, I would be more concerned about the maintenance of liquid nitrogen in the semen tank than about minor differences in semen quality.

Begin by checking the motility of a straw of semen that was in the tank throughout the time you were breeding the cows. Your

veterinarian or AI representative can check it. If the tank went dry and the semen thawed out, it would have killed the sperm cells in all the straws stored in the tank, and the percent motility in the straw tested would be zero. If the semen you test has reasonable motility (>20%), the problem is not the semen tank.

If the semen proves to be okay, then a decision has to be made about the individual open cows. Frankly, if the breeding success you have had in the past has been very good, and this problem is isolated to just these seven cows, I would suggest you should just cull them and move on.

On the other hand, if you have suffered poor reproductive results in the past and think this is a symptom of a bigger problem, these cows could be an excellent way to try to learn more about your problems.

The best method for tracking down the cause of recurring breeding failures or embryo losses is by working with your veterinarian. You could focus on the seven cows that were open after two breeding seasons.

Collecting urine and blood samples from those cows would allow you to test for a leptospirosis problem. Testing those cows for persistent bovine viral diarrhea (BVD) infection and testing the calves of all the other cows in the herd could be used to eliminate persistent BVD as a potential cause of the abortions.

This would be a good place to start, but your veterinarian may have other suggestions that could help you as well.

Breeder's question:

I collected 72 embryos from six donor cows last winter and had them transferred to recipients in a contract recipient herd in another state. The pregnancy rate of the commercial recipients that received my embryos was 52%, and I am a little

disappointed. What needs to be done to improve the results?

Response:

First of all, 52% pregnancy rate after transferring frozen embryos is *not* that bad. Occasionally you hear of breeders claiming a 70% ET pregnancy rate. Often those rates have been achieved with fresh embryos or were done with a small group of cattle.

Trying to improve your pregnancy rate should begin by working with the ET practitioner and the contract recipient herd owner. (They also want to do better.) Telling them you want to improve, compiling data on your embryos and comparing your results to those of other breeders using the same recipient herd is a good place to start.

You can learn a lot about the potential of the embryos you provided by calculating the pregnancy rates achieved when your Grade 1 (excellent) vs. Grade 2 (good) quality embryos were transferred. Normally, pregnancy rates following the transfer of Grade 1 frozen embryos will be 4%-12% higher than following the transfer of Grade 2 embryos. If that difference exists, it suggests heat detection, transfer techniques and other factors affecting pregnancy rate are operating normally.

Comparing pregnancy rates achieved with your embryos to those achieved with embryos supplied to the contract recipient herd by other breeders is a good check on the quality of your embryos. Assuming the transfers are made by the same practitioner and the recipients are assigned equally, pregnancy rates achieved using your embryos should be within 10% of the best pregnancy rates achieved. Make sure your comparisons take into consideration the embryo quality grade (1s or 2s) when you make comparisons.

If your embryos do much worse than those of other breeders, you should share that information with the ET practitioner who collects and freezes your embryos. There may be things to change with management of the donors or handling and freezing of the embryos that can improve the situation.

If your embryos stack up well against those of others, but the overall pregnancy rates of the recipient herd can be improved,

looking at recipient body condition, vaccination protocols, heat detection methods or transfer techniques would be logical topics for a discussion with the recipient herd owner and the practitioner doing the transfers.

The *key to improving* is working together. Making an ET practitioner or recipient herd owner defensive and angry will not improve your results. Get some data to share, and work together to make improvements.

Breeder's question:

I am in the process of administering follicle-stimulating hormone (FSH) for superovulation of one of my donor cows, and the veterinarian is scheduled to begin tuberculosis (TB) testing on my whole herd today. Will the injection used for the TB test affect the embryos collected from my donor cow?

Response:

Routine field-testing of TB is done using the caudal fold tuberculin test. In this test, 0.1 mL of purified protein derivative (PPD) is injected into the skin of the caudal fold near the tailhead of each animal. The injection site is examined 72 hours later for evidence of swelling that would be caused by the animal having had an active case of TB.

The PPD is only a part of the bacterial organism that causes TB. It cannot infect the animal with TB, and therefore, should not be harmful to the response of the donor or the quality of the embryos collected from her.

Editor's Note: Bill Beal is a beef cattle reproductive physiologist at Virginia Tech. He conducts research involving estrus synchronization, AI, 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.

Association Signs Agreement with USDA

The U.S. Department of Agriculture's (USDA's) Animal and Plant Health Inspection Service (APHIS) has signed a cooperative agreement with the American Angus Association.

A ceremonial signing took place at the Association's headquarters in Saint Joseph, Mo., Aug. 8 to recognize the cooperative efforts of both groups in the education of the premises registration process and enrollments.

In recent years, biosecurity issues around the world have prompted action in the United States to avoid similar outbreaks potentially threatening our food supply. It also sparked an overall effort to educate those in production agriculture on the risks and preventative measures associated with biosecurity issues. Traceability through premises registration has been identified as one key preventative component in this effort.

Under the terms of the agreement announced, the Association will utilize its resources to provide every Association member with education about the National Animal Identification System (NAIS). Educational efforts will include on-site educational discussions through the Association's Outreach Seminars and other educational programs, print advertising, direct mail and e-mail communications.

In addition, with the assistance of ABG Inc., online training programs will be available to cattle producers across the nation. The online program will describe the value and benefits of registering premises and the steps necessary to complete an enrollment.

Food and agriculture biosecurity are an important component of USDA's mission. Improving awareness through enhanced outreach and communications is a key element of homeland security efforts.

"It is critical to manage events which help prevent and mitigate the spread of diseases affecting animal health and food safety," said Marty Vanier, Manhattan, Kan., who serves as the associate director of Kansas State University's (K-State's) National Agricultural Biosecurity Center. "The consumer wants to know the product they eat is not only palatable and enjoyable, but most importantly, is safe. The American Angus Association, through the *Certified Angus Beef*® program, AngusSource® and now through this grant, is illustrating its desire to ensure the safety of the end product for the consumer."

Founded in 1883, the Association has had a significant effect on the cattle industry, having registered more than 15 million Angus cattle, with 347,572 head of cattle registered in 2006. In recent years, the organization has implemented programs such as AngusSource, a genetic-, age- and source-verification program that assists producers in the documentation and authenticity of Angus genetics that ultimately enter the food chain.

AngusSource also joined forces with Pfizer Animal Health to promote the importance of good herd health. In January, the Association released the results of *Priorities First*, the first comprehensive attempt to prioritize management and economic issues for cow-calf producers.

"This collective effort of livestock organizations and state and federal authorities is the first step in protecting the health of America's livestock industry. The American Angus Association is pleased to have the opportunity to assist livestock producers register their premises," said John Crouch, Association executive vice president.



▶From left, Bruce Knight, USDA undersecretary for marketing and regulatory programs; Association Executive Vice President John Crouch, Saint Joseph, Mo.; and Association President Jot Hartley, Vinita, Okla., sign a cooperative agreement to promote and educate beef cattle producers about the NAIS and to encourage producers to register their premises.

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Editor's Note: Release provided by the American Angus Association.