



Repro Tracks

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

Prebreeding vaccinations and bull fertility

Pregnancy rate during the breeding season is determined by factors attributed to both the bulls and the cows in the breeding herd. The vaccination status of the cows and the inherent fertility of the bulls are two critical factors. When to vaccinate cows and how to assess the fertility of bulls are both important prebreeding decisions. The following represent common questions posed by breeders regarding such decisions.

Question No. 1

I am synchronizing heifers with a melengestrol acetate (MGA)-prostaglandin (PG) treatment. Is it okay to vaccinate with a modified-live virus (MLV) vaccine for infectious bovine rhinotracheitis (IBR), parainfluenza-3 virus (PI₃), bovine respiratory syncytial virus (BRSV) and bovine viral diarrhea (BVD) at the time I give the PG injection (two to five days prior to breeding)? I've received conflicting advice about possible effects on achieving good conception rates.

Response: Good research data to answer this question are scarce. After checking three sources, it became obvious that the very best protocol to recommend would be to vaccinate with any MLV vaccines 30 days prior to breeding. This would give the best immunity during the breeding season and pregnancy, when it is most important to have the highest level of protection.

All sources I checked indicated that it is safest to give MLV vaccines at least 30 days prebreeding, because there is some concern that the virus may replicate in the ovaries for a few days after injection. That could decrease fertility.

After giving the "safe" answer, two sources went on to indicate that if your herd was maintained on a stringent vaccination program in the past, and each animal had already received MLV vaccines in the past, the risk of lower fertility was probably minimal. However, they were quick to point out that naïve animals (those that were not vaccinated or failed to respond to previous vaccine) were certainly at risk of lower fertility when vaccines were administered immediately before breeding.

In conjunction with an MGA-PG synchronization program (14 days of MGA, wait 19 days, and inject PG), rather than vaccinating at the time of the PG injection, it is probably better to vaccinate when the

MGA feeding starts. This maximizes immune protection and eliminates any risk of reducing fertility.

Question No. 2

Are you familiar with the ReproTest for bulls, which measures the presence of fertility-associated antigen (FAA) in semen? We have a bull customer who read a popular press article about this and wants us to check all our bulls for FAA. We don't know much about it and thought we should research it a little to see if it is worth spending \$30-\$40 per head to test them. Do you have any experience with or an opinion about this fertility test?

Response: The ReproTest, which determines the presence or absence of a fertility-associated protein in the semen of bulls, was introduced as a chute-side diagnostic test in 2004 (see "The Evidence Mounts" in the January 2004 *Angus Journal*). The test is based on several years of research by University of Arizona animal science professor Roy Ax and his colleagues. Their research results have been published in peer-reviewed scientific journals. Hence, the validity of the fertility-associated protein being "real" is not in question.

The company marketing the ReproTest reported that 26.5% of the beef bulls they tested in 2003 were FAA-negative. Based on other research, they claim that FAA-negative bulls should have a 17% lower pregnancy rate when used in natural-service mating.

These statistics are scary to breeders who sell bulls. Consider what would happen if an Angus breeder tested 100 bulls, and 26 bulls were found to be FAA-negative and branded with the "low-fertility" label. Bull buyers would either drive the price of those bulls down to meat price or simply refuse to purchase the bulls. A 26% cull rate on bulls that had completed a feed test would be financially devastating to most breeders.

Therefore, the fear of the FAA test is one reason breeders are hesitant to use it, but it is not the only reason.

Most breeders are skeptical of both the high rate of "low-fertility" bulls and the magnitude of the decrease in fertility reported by the company marketing ReproTest. When I contacted three breeders who each marketed more than 500 bulls per year to commercial producers, they indicated that they received complaints about fertility or were asked for replacement of less than 4% of the bulls they sold per year, and that included bulls that were injured in their first breeding season.

Furthermore, data reported by Australian researchers (see *Animal Reproduction Science* 2002, Vol. 71:39-49) indicated that only 7% of the 93 bulls they tested were FAA-negative, and the bulls that were FAA-negative sired as many calves as the bulls that were positive for the protein.

Finally, one major artificial insemination (AI) stud that I contacted had tested more than 100 young sires before sending their semen out to the field. Fewer than 10% of those young sires tested FAA-negative, and there was no significant relationship between the FAA status and the AI conception rate recorded for those sires.

If you are a breeder, the decision about whether to test bulls for FAA comes down to a cost/benefit analysis. The test costs \$30-\$40 per bull. If fewer than 10% of the bulls are FAA-negative, and if the effect on fertility is not as large as originally reported, it is difficult for the breeder to justify the expense of testing all bulls. On the other hand, the bull buyer who buys only one or a few bulls per year may be willing to pay to have his bulls tested.

One possible compromise may be for the breeder to collect and retain a frozen sample of the semen collected from each bull at the time a presale breeding soundness exam is conducted. The bull buyer would then have the option of having the bull's semen tested after the sale at his expense if the information on the FAA status was important to him.

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Editor's Note: Bill Beal is a beef cattle reproductive physiologist at Virginia Tech. He conducts research involving estrus synchronization, AI, embryo transfer (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 Department of Animal & Poultry Sciences, Virginia Tech, Blacksburg, VA 24061-0306.