



# Repro Tracks

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

## Update on sexed semen

*The technology to sort X- and Y-bearing sperm enabled the first marketing of sexed semen in 2006. Extensive scientific testing indicated the process would allow producers to choose the sex of calves with 90% accuracy, but would result in lower pregnancy rates. The interest of beef producers and artificial insemination (AI) companies in sexed semen has been greater than expected, and we have learned a lot in the first year of using sexed semen.*

### Accuracy and sexing technology

A year ago, two “Repro Tracks” columns about sexed semen appeared in back-to-back issues of the *Angus Journal* (September and October 2006). At the time, sexed Holstein semen had been used sparingly, and dairymen were being cautioned that although the accuracy of the procedure was 90%, conception rates with sexed semen would be 25% lower than using conventional frozen-then-thawed semen.

A year ago, no semen from Angus bulls had been sorted for sex selection, and the prospects for sexed semen from popular, high-demand Angus sires to be offered looked dim. A lot has changed in a year, and a lot has stayed the same.

Reports from the field have verified the research predictions of a 90% accuracy in sex selection when semen is sorted using the flow cytometry technique exclusively licensed to Sexing Technologies ([www.griglobal.com](http://www.griglobal.com)).

While the accuracy of the sperm sorting process is very high, the speed and efficiency of the process is still slow and inefficient. Operating a flow cytometer to sort semen 24 hours a day results in the production of about 150-200 units of male- or female-selected semen. During the process, 30% of the original semen collection is discarded.

The speed and inefficiency could be reduced with the current technology, but the accuracy of the process would also be reduced. Hopefully, there will be changes in the design of the flow cytometer that can both speed up the process and reduce the wasted semen in the next few years.

It should be noted, an AI company has recently announced it will offer “gender-biased” semen. This process does not involve flow cytometry to sort X-bearing and Y-bearing sperm. According to the company’s own in-house research trials, insemination

with “gender-biased” semen resulted in an additional 10 heifer calves per 100 pregnancies.

The company also claims the “gender bias” process does not reduce the fertility of the semen. This is an interesting announcement; however, no verification of this procedure has appeared in scientific journals.

### Popularity of sexed Angus semen

Reports are that the sale of sexed semen from Angus bulls supplied by ABS Global has been better than expected. Producers using the sexed semen have confirmed the high accuracy of the sex selection process.

When pregnancy rates were averaged across all farms reporting the use of sexed semen and compared to pregnancy rates following the use of conventional semen on the same farms, the pregnancy rate with sexed semen was 20%-25% lower. Those results were as expected based on research trials done prior to marketing sexed semen.

The unexpected result of using sexed semen may be that on some farms there was only a slight reduction ( $\leq 5\%$ ) in pregnancy rates, while at other farms the reduction was much greater ( $\geq 30\%$ ). The variability in results may reflect differences among farms and inseminators in the accuracy of heat detection and the quality of the inseminator’s technique. Differences among farms and inseminators that don’t show up when conventional semen is used may become apparent when the lower number of sperm in the straws of sexed semen is used for inseminations.

Contrary to the predictions in the September 2006 “Repro Tracks” article, sexed semen from popular AI sires has been made available, at least by one AI company. This has prompted more breeders of registered Angus cattle to consider the use of sexed

semen, especially for use in embryo transfer (ET) programs.

### Sexed semen and ET

During the past 12 months, several ET practitioners and their clients have experimented with the use of frozen sexed semen to breed superovulated donor cows. Several of them shared their results in a panel discussion at the annual meeting of the American Embryo Transfer Association in August 2007.

All practitioners reported recovering fewer transferable embryos from donors bred with sexed semen. The reductions varied from one to three embryos per collection. The largest controlled study was reported by Trans Ova Genetics. In that study 50 select donors were flushed to recover embryos after being superovulated and bred with frozen, sexed semen and yielded 5.8 transferable embryos per collection. The same donors flushed after superovulation and breeding with conventional semen averaged 7.2 transferable embryos per flush.

The consensus recommendations of the practitioners using sexed semen to breed donor cows were as follows:

- Donors bred with sexed semen should be inseminated with at least 20 million sexed sperm (four straws of semen).
- Donors bred with sexed semen should be bred later after detection of heat than donors bred with conventional semen. Most recommended two breedings with at least one occurring between 24 and 30 hours after heat detection.

The past year has revealed many things about the use of sexed semen. However, the use of this new technology is still in its infancy. You should expect much more information and many improvements in the technology in the next few years.

**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 him at [wbeal@vt.edu](mailto:wbeal@vt.edu) or mail them to him at the Dept. of Animal & Poultry Sciences, Virginia Tech, Blacksburg, VA 24061-0306.