Calf Gender Made-to-Order

by ***Troy Smith***

Flat Stone Lick, a Hereford operation located near Marianna, Pa., sells only a handful of select bulls each year. According to owner Les Midla, there is far more demand for females. If Midla could choose, a majority of calves born to the herd would be heifers. He is choosing, actually, through artificial insemination (AI) with sexed semen.

"We don't have a big market for bulls here in the East, but we can sell females. We also turn our genetics over rapidly, replacing cows by the time they are 6 years old," Midla explains. "So we like having the ability to breed for heifer calves. And we don't have to breed as many females to produce a group of heifers."

PHOTO BY MALLORY PHELPS

Old new technology

Midla ranks among the relatively few beef cattle breeders using sexed semen. It's still considered a new technology, but the first gender-selected calf was produced through AI more than a decade ago. With it came expectations for increased use of the sophisticated process for separating sperm with X-bearing chromosomes (female) from sperm with Y-bearing chromosomes (male) and increased application of sexed semen.

In the laboratory, X- and Y-bearing sperm can be distinguished according to their respective content of deoxyribonucleic acid (DNA). In mammals 3.8% more DNA is contained within the X chromosome, and that difference is detectable through cytometric analysis. Put plainly, this sperm-sorting technology allows for routine production of semen with 90% purity for a specific sex.

Practical application grew most rapidly within the dairy industry, due to its already extensive use of AI and the obvious advantage gained through selection for predominately heifer calves. Generally, sexed semen has delivered on its promise that a minimum of 90% of resulting calves will be of the chosen gender.

Adoption by the beef industry has come more slowly, embraced mostly by seedstock breeders. Some, like Midla, have used sexed semen to maximize production of replacement-quality heifers. Other breeders, wanting to target a market for breeding bulls, use sexed semen to increase the percentage of male calves born.

ET use

Controlling gender is advantageous when producing embryos from select females too. That's why Thedford, Neb., breeder Jason Hoffman introduced sexed semen to an embryo transfer (ET) program concentrating on production of both show heifers and replacement females. The results were somewhat disappointing.

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explains Hoffman. "I still think it's a promising tool but maybe not with ET. Sexed semen is a little more expensive, and it's hard to get for some sires, but that could change."

Too soon to tell

Midla has used sexed semen to inseminate both heifers and cows, following estrus synchronization. His results have been mixed. However, Midla is accustomed to some yearly variation in conception rates following use of conventional semen too. His is a forage-fed herd, and results from AI depend on the nutritional status of females.

"The jury is still out," says Midla, when asked how conception rates with sexed semen compare with conventional semen. "But we're going to stick with it to find out."

The use of sexed semen, commercially, is still new enough that few breeders have yet to collect much data on conception rates. Research trials suggest conception rates following AI with sexed semen will be about 85% of those achieved with conventional semen. Therefore, a producer accustomed to 70% conception rates should realize a 60% conception rate with sexed semen.

Some research suggests insemination of lactating cows with sexed sperm results in pregnancy rates lower than those achieved with virgin heifers. Too few data are available for valid conclusions, but lower pregnancy rates in cows may be due in part to uterine involution, lactation and higher nutritional needs which occur during the time cows are inseminated. More bull-to-bull variation also may exist in pregnancy rate with sexed sperm in cows than in heifers.

Just as sperm from some bulls have higher tolerances for freezing and thawing, tolerances for sorting sperm may vary among sires. Fertilizing potential of sorted sperm from average fertility bulls may approach maximum levels if increasing sperm dosage can compensate for lower fertility, but low-dose insemination of sorted sperm from low fertility bulls likely will result in unacceptably low pregnancy rates.

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At what cost?

Sexed semen costs a little more than regular frozen semen — often $15 to $25 per straw more than conventional frozen semen. It does, after all, undergo an additional specialized process. No doubt, the higher cost has been an obstacle to some producers. That could change as "pioneer" producers build banks of favorable data.

Another incentive may be the newer "75%" sexed semen. This product promises that a minimum of 75% of resulting calves will be of the chosen gender. Less expensive than "90%" sexed semen, the newer product is usually priced $5 to $10 higher than conventional semen, depending on the individual sire. Marketers say producers should expect no difference in conception rate between 90% or 75% sexed semen.

Currently, Genex Cooperative Inc. is the only firm through which both 90% and 75% products are commercially available. Genex Beef Marketing Manager Willie Altenburg says the 75% product holds appeal for commercial cow-calf producers. Some commercial cattlemen using Hereford genetics seem particularly interested in using sexed semen to produce black and red baldies.

"I think we're going to see more replacement heifers bred AI, to have predominately heifer calves. It means more calving ease and about 3% greater calf livability when a first-calf heifer has a heifer baby. But producers trying to advance genetics quickly can also retain more replacements out of heifers," says Altenburg.

Eventually, commercial cattlemen may use sexed semen to enhance their crossbreeding programs by breeding their best cows to maternal sires (to raise replacement females) and raising steers out of their other cows bred to terminal sires.

"When you choose to have 75% of the AI-sired calves be heifers, you can reduce the number of females that need to be bred to produce replacements. The mature cows can be bred with 'male semen' to produce steers, using a terminal sire to target growth and feedlot performance," Altenburg adds.

Sexed semen is a promising reproductive management tool, but producers need to remember that it has its limitations. There are fewer sperm cells packaged in an individual straw and fertility is slightly compromised. Marketers advise producers to use their very best AI procedures, including heat detection. Females can be synchronized prior to AI, but only protocols that incorporate heat detection are recommended. Altenburg says sexed semen is not recommended for use with protocols for timed AI or for embryo production. **HW**