



ANGUS CONVENTION Select, Manage for Fertility

Angus University session focuses on increasing reproductive efficiency, from selecting replacements to managing the cow herd.

by **TIERRA KESSLER**
and **TROY SMITH**

If heifers have not reached puberty and cycled before the breeding season, they may be set up for failure as 2-year-olds, cautioned David Patterson, professor of animal science and beef extension specialist for the University of Missouri-Columbia. During an Angus University educational breakout session at the 2017 Angus Convention in Fort Worth, Texas, Patterson explained to producers the importance of selecting fertile heifers.

Weight alone cannot determine if a heifer has reached puberty and is ready to be bred, he emphasized. While age and weight at puberty are heritable traits that have proven to be consistent over time, there are other things to look at before making the assumption a heifer is ready to breed.

The beef industry as a whole is not fully utilizing a lot of the fairly basic tools available to improve reproduction by properly selecting, developing and managing replacement females, Patterson observed. There's technology sitting on the shelf that could and should be implemented. Cattle producers are



While the heifer pregnancy EPD ranks fifth in heritability among reproductive traits within the Angus breed, it is one that should not be overlooked, said the University of Missouri's Dave Patterson. He encouraged Angus producers to collect more and better reproductive data to strengthen the EPD.

charged with managing resources and other factors contributing to how efficiently their operations are managed. The bottom line is the management has to end with profit, and how one juggles all the various considerations can maximize that profit.

Reproductive tract scores (RTS) are

one of the best predictors of fertility, Patterson said. It has been shown that age has a stronger effect on RTS than body weight or body condition score (BCS). Heifers should score an RTS of 4 or 5 before breeding, and they should ideally be on their third estrus.

Patterson presented research showing that heifers exposed for breeding on their pubertal estrus are about 21% less likely to get pregnant than those bred on their third estrus. You'd like to have the bulk of heifers cycling at the start of the breeding season as opposed to reaching puberty at some point during the breeding season.

The age and weight at puberty are much more highly heritable than any other reproductive traits. If we look at data from the American Angus Association relative to heritabilities and look at those relationships in a ranking, said Patterson, scrotal circumference (SC) and birth weight (BW) are the most highly heritable, but heifer pregnancy (HP), which is used fairly extensively, is relatively low.

While the HP expected progeny difference (EPD) ranks fifth in heritability among reproductive traits within the breed, it is one that should not be overlooked, said Patterson. Angus producers should strive to collect more

and better reproductive data to strengthen EPDs such as HP. In a group of 100 heifers by the same sire, a simple 5% difference in HP vs. another sire group means five more pregnant heifers on the first breeding.

Heifers that aren't ready to be bred at the start of the breeding season fall behind and calve later than the rest.

Most heifers that calve early in the herd and continue that calving pattern typically go on to wean heavier calves. The percent of cows that wean those calves is also a highly important consideration. When one looks at where losses occur in the industry, the largest loss occurs as a result of cows failing to become pregnant, Patterson explained. When one considers the reproductive cycle of beef cattle in general, success is highly influenced by growth and development.

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Heifers that aren't ready to be bred at the start of the breeding season fall behind and calve later than the rest, Patterson said. As a result, they are set up to fail as 2-year-olds when it's time to rebreed.

Develop heifers for efficiency

Increasing reproductive efficiency is a sure way to increase production efficiency,

allowing a cow-calf producer to increase production from a given number of cows and a given land base, noted Rick Funston, University of Nebraska reproductive physiologist.

Funston suggested producers consider time of calving and sire selection, with the goal of having less dystocia and more live calves born. He recommended

consideration of estrous synchronization coupled with timed artificial insemination (TAI), or synchronization with natural service, to increase efficiency.

"When we synch for timed AI, we need half as many bulls for cleanup," he stated. "We can synch for natural service and get more females pregnant in a shorter period of time, and we don't need more bulls."



"We can get heifers bred at lighter target weights than we thought we could 40 years ago. I'd argue that a heifer never has to gain more than 1.5 pounds per day," said Rick Funston, University of Nebraska reproductive physiologist.

Funston also emphasized heifer development that focuses on reproductive efficiency, with the ultimate goal of improved longevity and increasing the number of calves breeding females wean during their productive lifetimes.

He cited studies involving extensive heifer development systems whereby greater-than-needed numbers of heifers are developed on the same kinds of feedstuffs they will consume as mature cows, while targeting moderate breeding weights.

"We can get heifers bred at lighter target weights than we thought we could 40 years ago. I'd argue that a heifer never has to gain more than 1.5 pounds per day," said Funston, adding that getting heifers too fat is a waste of resources that is counterproductive, resulting in less fertile females with less longevity.

"Fertility is lowly heritable so management can have a significant effect," stated Funston. "We've got to do the right things at the right time."

Funston advised listeners to consider developing more heifers than needed, giving all of them an opportunity to get pregnant, but keeping only those that conceive to first service. The result will be higher lifetime productivity from fertile females that fit the production environment.

Funston said a sometimes-neglected aspect of replacement heifer management is postbreeding nutrition. He reminded producers that avoiding nutritional insult and other stress factors can lower the incidence of early embryonic mortality.

Select for pregnancy

"The most important benchmark for a beef cow operation is the percentage of cows that calve early in the calving

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Strict selection for pregnancy while at his previous post with the University of Florida's North Florida Research and Education Center helped the Center increase the value of the research herd's annual production by \$50,000, shared Cliff Lamb.

season," said Cliff Lamb, who heads Texas A&M University's Department of Animal Science. "I believe the most efficient operations are those with a high number of cows calving in the first 30 days."

Lamb explained how he emphasized selection for pregnancy at his previous post at the University of Florida's North Florida Research and Education Center (NFREC).

"We synchronized all heifers and cows for timed AI," Lamb explained. "For us, heat detection is a waste of time — a hassle factor that timed AI eliminates."

In 2008, Lamb and the NFREC staff implemented estrous synchronization, AI, shortened periods of exposure to cleanup bulls and applied strict female culling rules:

- replacement heifers had to calve by 24 months of age;
- once entering the herd, cows had to calve every 365 days;
- cows had to deliver without assistance, produce sufficient milk for their calves to reach their genetic potential while themselves maintaining body condition appropriate for the environment; and
- replacement candidates had to become pregnant in the first 25 days of the breeding season.

By sticking to the rules for applying selection pressure for pregnancy for seven years, the NFREC herd's original 120-day breeding season was shortened to 60 days. During that period, timed-AI pregnancy rates ranged between 33% and 59%. Lamb acknowledges that many producers would not be satisfied with those rates, but he's less concerned with the percentage of females pregnant

to AI than the total number of females that became pregnant early.

"The synch protocols kick-started (the cycles of) more cows that were picked up by the cleanup bulls. We increased the total number of cows that got pregnant early while cutting the breeding season in half," said Lamb, noting that their calves represented more value since more of them

were born early and weighed heavier at weaning. The value of the research herd's annual production increased by \$50,000.


Lamb advised producers in the Angus University audience to remember that synchronized AI is not just about introducing select genetics. It can also be a tool for improving reproductive efficiency.

Editor's Note: This article was written under contract for or by staff of the Angus Journal as part of Angus Media's coverage of the 2017 Angus Convention. Tierra Kessler is a freelance writer and Angus producer from Milton-Freewater, Ore. Troy Smith is a freelance writer and cattleman from Sargent, Neb. For complete coverage of the event, visit www.angus.org/Media/News/AngusConvention.aspx.

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