

Genetic Progress

Utilize technology to advance herd genetics.

by Chel Terrell

Progressive breeders are continually searching for ways to improve genetics in their herds and are willing to utilize many of the advanced technologies available to them in the quest to raise and market the most elite animals possible.

Tools such as artificial insemination (A.I.) and embryo transfer (E.T.) have enabled Beefmaster breeders to enhance reproductive efficiency and use some of the best genetics available to them from a wide array of sires and dams. These producers are finding that the rewards for using these technologies are paying dividends, especially when it comes to synchronizing the cowherd for breeding and narrowing the calving season window.

“There are certainly a lot of advantages for having the opportunity to inseminate cattle with the best genetics from anywhere in the world using A.I. and E.T.,” said Dr. G. Cliff Lamb, Associate Professor of Animal Science and Supervisor of the North Florida Research and Education Center Beef Unit. “It’s an affordable way to use elite animals in a breeding program, especially for smaller breeders. But to me, many of the advantages come in terms of what it does to your calving distribution and the positive effects on the cowherd.”

For example, Lamb notes that many of the estrus synchronization protocols now on the market for both A.I. and E.T. stimulate non-cycling cows to start cycling. This gives producers the opportunity to get cows pregnant earlier in the breeding season than if estrus synchronization protocols were not used.

“In many cases you might not get the cows pregnant to A.I., but they will become pregnant sooner in the breeding season,” he said. “The advantage then is those cows calve sooner in the subsequent year and have more time to recover and start their estrus cycles the next year. They will become pregnant sooner in subsequent years as well.”

Dr. Dave Patterson, University of Missouri animal science professor, agrees that synchronizing estrus has numerous benefits.

“Synchronization can really be used to facilitate A.I. and also works effectively to enhance reproductive management,” he said. “It’ll be noticeable the first year, but over a period of years, the results end up being more or less cumulative in terms of a larger number of cows calving earlier in the calving season as a result of having conceived earlier. If they calve earlier, they have more time to recover following calving. There’s typically an increase in the percentage of cows that are cycling going into that subsequent breeding season. Over time, you can really see progress in a herd.”

“It’s almost like a revolving door,” Lamb said. “It sort of continues improving on itself. It allows you to reduce your breeding season so you’re not calving for as long a period of time and it gives you a more uniform calf crop, which is tremendously positive.”

A.I. is an excellent tool to use on virgin and first-calf heifers. Lamb notes that virgin heifers are the easiest animals to A.I. and synchronize because they are not nourishing a calf.

“It’s actually a very good place to start synchronizing your heifers, then gradually move into also synchronizing cows,” he said.

First-calf heifers, on the other hand, can be tougher to get pregnant because their next cycle tends to be longer. However, using an estrus synchronization product such as CIDR® – an intravaginal progesterone insert that is used in conjunction with other hormones, will stimulate those females to start cycling.

“That group of females benefits tremendously from estrus synchronization and A.I.,” Lamb said.

Growing Pains

In the overall landscape of the cattle industry, A.I. has largely been an underutilized tool. Producers primarily cite a lack of time and labor resources as the reason for not using the technology. But Lamb said that implementing fixed-time A.I. protocols actually reduces the time and labor “hassle” often associated with A.I. and estrus detection.

“There’s no question A.I. is an underutilized technology,” he said. “There are more than 30 million cows in this country, and only between 1 and 2-1/2 million are A.I.’d every year.

“We’ve now developed economical, reliable systems that enhance fertility and allow producers to A.I. cattle at a predetermined fixed time where you do not have to do any heat detection and still get good pregnancy rates. And you only have to handle cattle three times, which reduces stress in animals.”

This fact is especially beneficial for producers that work off the farm or ranch.

“Folks that cannot be around the cows every day can schedule when to A.I. cows months in advance and hire a technician to come out and inseminate cattle on a certain day rather than having to worry about heat detection,” Lamb said.

It also decreases the number of bulls a producer has to own, he notes.

“When you actually put pencil to paper, the cost of A.I. is really not that much different than the cost of owning a bull.”

Despite many breeders not capitalizing on the technology, Patterson said he actually sees a growing number of cattlemen in his state benefiting from A.I. use.

“We’ve got a lot of small herds in Missouri and we’re getting more and more people using it, especially the timed-A.I. programs,” he said. “They’re working successfully and consistently enough where lots of people with small herds that might work off the farm can now schedule things where they can manage an A.I. program but not have to devote the time and labor to the extent they would have in the past.”

Using EPDs to help select elite sires to use in an A.I. program has also helped improve herd genetics in recent years. Patterson and Lamb both emphasize the importance of paying attention to indexes and high accuracies when selecting sires.

“Producers should not only pay attention to EPDs, but also focus on the accuracies. The accuracies will give you a good indication to the reliability and predictability of that information,” Patterson said. “It takes a lot of the guesswork out of a mating system.”

“Any tool that you can use to increase your chance of selecting bulls that are going to improve your genetics is good,” Lamb said. “EPDs are one of the primary things, but taking a look at indexes and then making sure you’re using high accuracy sires is important.”

With the high cost of raising cattle in today’s volatile economic conditions, using tools to select more efficient animals is crucial to managing a productive operation.

“Producers may want to consider starting to use selection tools that might include a feed efficiency EPD or energy index. Those are very important indexes to consider down the road,” Lamb said.

Lamb cautions breeders to stay away from single-trait selection when choosing sires to use in an A.I. program, especially in terms of genetic markers.

“Genetic markers tend to only account for less than about 20 percent of the variation in the outcome in how these animals actually respond. EPDs are far more accurate than genetic markers at this point.”

Embryo Transfer Success

Effective estrus synchronization programs have also benefited producers who choose to use embryo transfer in their operations, a technology typically utilized more extensively in the purebred business.

“You essentially use the same type of estrus synchronization systems that you use on your cows for A.I., except rather than A.I., you can transfer embryos a week later into your cows,”

Lamb said. “E.T. gives people the opportunity to bring in outside genetics from both the sire and the female side. You can improve your genetics fairly fast that way.”

The cost of using embryo transfer sometimes inhibits a producer’s decision to use the technology.

“There’s no question that the expense is higher for E.T. than A.I.,” Lamb said. “It tends to be for the purebred producer. So if you’re a Beefmaster producer and you want to improve your genetics, that’s a very good way of doing it. But you don’t necessarily have to own donor cows. You can purchase embryos that have been frozen and transfer those.”

“The goal of E.T. is identifying superior animals and then increasing the number of progeny that they can conceivably produce as a result of superovulation and embryo transfer,” Patterson said. “It’s a great technology; another tool to facilitate an increase and improve genetics both in purebred and commercial operations.

“It’s used more extensively in the purebred business, but a lot of commercial operations are partnering with purebred breeders to use their cows as recipis. Partnering with purebred operations on a commercial basis can help people add value to what they are producing.”

Future Genetics Benefit from Technology

Utilizing tools such as artificial insemination and embryo transfer can enable a producer to optimize production efficiency and raise more genetically elite animals. They are attractive options to advance herd genetics instead of spending big bucks on expensive sires and dams.

As producers become more knowledgeable about the process – many attend specialized schools to learn how to A.I. and E.T. cattle themselves – this can be an affordable and profitable decision for the operation.

SIDEBAR:

Synchronization Planner

The Iowa Beef Center offers an Excel spreadsheet program to assist producers in making informed management decisions and to effectively apply synchronization protocols in their program during a calendar year. The Estrus Synchronization Planner, available at www.iowabeefcenter.org, offers the following features:

- Assist with the challenge of planning and implementing some of the more complicated synchronization systems.
- Eliminate errors in the timing of injections, starting and ending the feeding of MGA, CIDR insertions, etc.
- Help to optimize labor use.
- Allow you to analyze and compare input costs of several synchronization systems.