

Outside a Feeling

Early pregnancy diagnosis and fetal sexing are practical applications for ultrasound.

by Troy Smith

For many cow-savvy producers, talk about pregnancy-checking the cow herd evokes an image of their trusted veterinarian poised at the tail end of a cow. Wearing a plastic sleeve and a wistful expression, the country veterinarian is up to his or her elbow in the task. Actually, the reach often extends well past the elbow, as the vet feels for an answer.

Rectal palpation remains by far the most common method of determining pregnancy among cattle, but the day may be coming when “feeling” for evidence of pregnancy gives way to seeing it on a viewing screen. To a degree, it’s happening already.

Cliff Lamb, University of Minnesota bovine reproductive physiologist, says ultrasound technology, or ultrasonography, is gaining ground as a means of determining pregnancy and for diagnosing uterine and ovarian abnormalities and infections. It is a less invasive procedure and, Lamb says, the information-gathering capabilities of ultrasound imaging are far superior to those of rectal palpation.

Looking inside

In layman’s terms, ultrasonography involves exposing reproductive organs to ultrasound waves. Based on the capabilities of various tissues to absorb or reflect the waves, the technology transfers an image to a viewing monitor. Tissues that more readily absorb ultrasound waves appear black in the image. Other tissues appear in various shades of gray, depending on their ability to reflect ultrasound waves. A skilled technician can distinguish individual structures and actually “see” what’s going on.

“From a research standpoint, ultrasound has given us the ability to visually characterize the uterus, fetus, ovary, corpus luteum (CL) and follicles,” Lamb states.

“Without ultrasound, we wouldn’t understand the follicular wave system or have developed timed AI (artificial insemination) to the extent we use it today.”

As a diagnostic tool, Lamb adds, the technology has come a long way. Two areas of practical application seeing increased use are early pregnancy diagnosis and fetal sexing. Through ultrasonography, pregnancy can be determined after 25 days of gestation, allowing for an accurate estimation of conception date. At approximately Day 50, male and female fetuses can be differentiated. Both applications can enhance marketing strategies for registered and commercial cow-calf producers.

Such is the case among a growing number of clients served by veterinarian John Voegeli and his colleagues at Animal Clinic Ltd. in Winner, S.D. Voegeli says 90% of the clinic’s work is performed for cow-calf producers, including a large number of registered seedstock breeders. On the whole they are a progressive bunch, interested in applying new technology — when it is practical. In many instances, interest shown by purebred breeders has been passed on to their seedstock-buying customers.

The value of ultrasound for reproductive work became apparent to Voegeli about 11 years ago. To help several clients prepare for their registered female sales, the practice called in an ultrasound expert, Montana veterinarian Ralph Miller.



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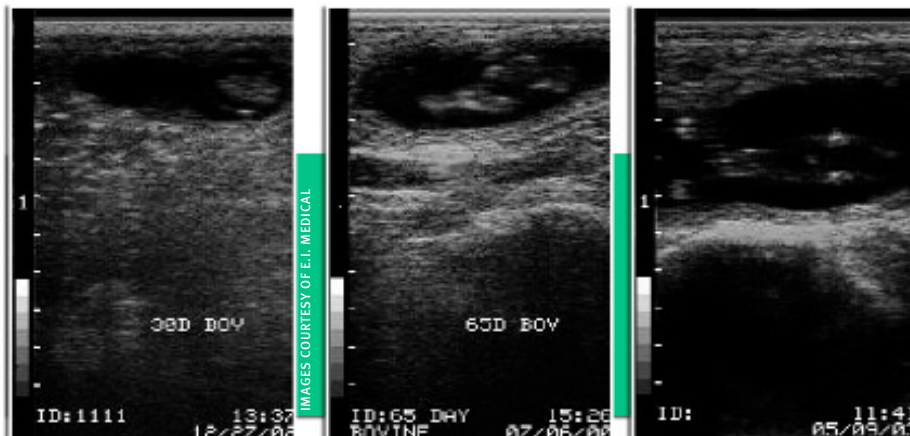
“Once Miller showed us, we knew that we had to gear up to do this ourselves,” Voegeli states, adding that the clinic now applies ultrasound to reproductive examinations of more than 20,000 head per year. “There are so many ways to use it. It can be a tremendous marketing tool for the purebred breeder, but more and more commercial ranchers who use AI are finding ultrasound useful, too.”

Practical application

Voegeli says application of the technology to a seedstock operation, for earlier determination of pregnancy, allows females to be sorted into separate management

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► Through ultrasonography, pregnancy can be determined after 25 days of gestation, allowing for an accurate estimation of conception date. At approximately Day 50, male and female fetuses can be differentiated. These images show examples of (from left) a fetus at 30 days, a fetus at 65 days and an image used to determine a bull calf.



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groups. Open cows can be identified for reinsemination or as recipients for an embryo transfer (ET) program. Ultrasound evaluation can also be used to evaluate and manage embryo donors. The ability to identify viable embryos and determine their sex also offers marketing opportunities.

“Breeders can know what they have right now, instead of waiting seven or eight months to see the results of a particular mating. It might allow them to market embryos to better advantage,” Voegeli explains. “And, if there are several partners involved, as we often see, they can decide how to divide the heifer and bull embryos resulting from a flush.”

Voegeli says most of the ultrasound work performed for commercial operations involves heifers that have been Aled. Knowing exactly which heifers are settled by AI and the sex of the calves they carry, producers can decide which heifers to keep, sell or feed out. Voegeli says several of his clients choose to keep replacements pregnant with heifer calves, because those babies represent the freshest genetics from which to choose future replacements.

Keepers can be sorted based on breeding interval and managed according to their estimated calving period. Some of Voegeli’s clients say this fits well with the Sandhills Calving System. That calving strategy, developed by University of Nebraska researchers, calls for managing females with older calves separately from those with young or newborn calves to minimize the spread of scours (see “The Sandhills Shuffle,” pages 27-30, March 2004 *Angus Beef Bulletin*).

“Knowing when they were bred can be a real plus for producers who market bred females,” Voegeli adds. “Some buyers may pay more for packages of heifers with a tight calving period. In our area, quite a few producers are shifting to a little later calving season, so there’s been a real demand for April calvers.”

As in much of cow country, drought has tightened grazed and harvested forage supplies in South Dakota. The last three years have brought an increase in the number of commercial ranchers wanting to ultrasound their herds to hasten culling decisions.

“They can identify and market open cows 30 days sooner if they want to — a good

option to have when grass is short,” Voegeli notes. “We can also give them an accurate breeding date. If they have to sell some bred cows, too, they can decide whether to sell early- or late-calving groups.”

Examine the details

While it has saved or made money for a number of his clients, Voegeli is quick to warn that reproductive evaluation with ultrasound is not for everybody. Of the producers who call for Voegeli’s advice, about half are told that their individual situations may not warrant the cost.

It’s not cheap. Voegeli says an ultrasound examination usually costs three to four times as much as rectal palpation, and it requires more time. Voegeli believes there needs to be real potential for recovering the cost. Producers must consider whether the information revealed through ultrasound can be used to add value to their animals. Right now, application of ultrasound seems more likely

to be advantageous to producers using AI rather than natural service, particularly to purebred breeders or commercial producers who merchandise replacement-quality females.

A major factor affecting the success of ultrasound application is the expertise of the technician. Voegeli admits that it took a lot of practice, on at least 2,000 head, before he was confident in his ability to interpret ultrasound images with accuracy.

Lamb says experienced ultrasound technicians remain relatively scarce. Some veterinary practices shy away because of limited opportunities to gain the experience needed to become proficient. Some back away from the investment in equipment, since ultrasound machines cost thousands of dollars. Another likely factor, Lamb says, is that most veterinary students are taught that ultrasound is a secondary technology for bovine reproductive work. Lamb believes that is changing.

“The area that has arguably benefited more from the development of ultrasound technology than any other area is reproduction in large animals,” Lamb states. “Practical application of ultrasound, by bovine practitioners, for routine reproductive examinations of cattle is the next contribution this technology is positioned to make to the livestock industry.”

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