

A Small Sample

Blood samples can be a quick, easy and accurate way for producers to check cattle for pregnancy.

Story & photo by **Mathew Elliott**



Pregnancy checking is an important management tool that can be used to make culling decisions. Open cattle cost producers money and resources, but inaccurately identifying pregnant cows as open can be costly, too. New technologies are being used to improve preg-checking accuracy, convenience and cost.

There are two traditional preg-checking methods, says Matthew Lucy, professor of animal sciences at the University of Missouri (MU). Palpation is the oldest and most common method.

The other common method is ultrasound scanning, which Scott Pooch, MU College of Agriculture Veterinary Medicine, says can be done later in the pregnancy to get more information.

A newer technology that Lucy and others in the beef industry are using is a simple blood test. First used in the dairy industry, the technique is now becoming more popular in beef circles.

"It uses a small blood sample to measure the amount of Pregnancy-Specific Protein B (PSPB) in the bloodstream," Lucy says. "These PSPBs are from the proteins that the placenta begins to produce the third week after conception. The PSPB circulate through the cow's bloodstream and are then detectable from a simple blood sample."

The lab that Lucy is currently sending his samples to is BioTracking of Moscow, Idaho. Its BioPRYN® (Pregnancy Ruminant Yes/No) test is mainly used to detect pregnancies in cattle, sheep and goats; however, it can also be used for pregnancy detection in elk, horses, bison and deer.

Don Coover, president of Genetic Horizons/SEK Genetics, Galesburg, Kan., has a regional BioTracking lab and works with producers who use the BioPRYN system. "For producers, this is an inexpensive and accurate test," he says. "What I like about this test is that it keeps some of my clients from palpating too early on young heifers. Palpating too soon could destroy a fetus; pulling a small blood sample is very safe."

The process

Taking blood samples is as easy as getting the females into a chute and drawing a small blood sample.

"It doesn't matter where the blood sample is taken from," Lucy says, "but be sure to be safe when taking the sample."

"I teach guys to tail-bleed at AI (artificial insemination) clinics and at other opportunities, but I know taking a sample from the neck is also a popular method," Coover says.

The BioTracking web site, www.biotracking.com, shows video and

suggests taking the sample from under the tail. The site provides downloadable instructions and sample submission forms.

Samples can then be overnighted or mailed second-day delivery to the company.

"The cost of the test is usually around \$2.40 to \$2.50 per sample," Lucy says. "The only other thing you need to add is your name and address, and within a few days, they will e-mail or fax you back the results."

Coover emphasizes the need to keep all labels and paperwork matched to the correct female, saying confusion and mix-ups could be disastrous.

Prices will vary based on supplies and the companies used, but both Lucy and Coover agree it is an economical alternative. Coover says they sell 100-pack sample bleeding kits that come with the clot tubes, 3.5cc syringes and needles. With this pack, the clot tubes are 17¢ each and the syringes with needle are 12¢ each. There is also the variable cost of shipping to consider, but Pooch says both palpation and ultrasound scanning costs vary, too.

"Palpation costs can range from \$1.50 to as high as \$8.00 per animal," Pooch says. "Ultrasounding usually ranges from \$2.50 to \$8.00 per animal."

According to Lucy, using blood tests provides several advantages to producers, including being able to detect a pregnancy at or fewer than 30 days.

"Diagnosis can be done earlier than palpation and as early as ultrasound," he says. While producers must wait to do the test until 90 days postpartum to ensure all PSPBs from the previous calf are out of the cow's bloodstream, the test can accurately detect the new pregnancy as soon as 30 days.

Future tests

Lucy and MU are currently working with new techniques to make blood-testing for pregnancy detection more efficient. Their answer is a chuteside or "cow-side" test.

Currently in development, this test is very similar to the test that is sent in, but it can be

Table 1: Comparison of pregnancy detection methods

	Rectal palpation	Ultrasound	BioPRYN blood test
Chuteside	Yes	Yes	No
Earliest diagnosis with reliability	30 days	26-27 days	30 days
Must recheck early pregnant diagnosis (<40 days)	Yes	Yes	Yes
Manipulation of reproductive tract	Yes	Yes/No	No
Cost	\$1.50-\$8.00	\$2.50-\$8.00	\$2.75 + syringe/needle + tubes & shipping
Able to check cow less than 90 days fresh	Yes	Yes	No
Able to age pregnancy	Yes	Yes	No
Able to tell sex of calf	No	Yes (60-100 days)	No
Able to accurately diagnose open cows	Yes	Yes	Yes
Able to identify dead/abnormal fetus	No	Yes	No

► **Above:** Matthew Lucy, MU professor, shows producers the at home blood-testing pregnancy detection test that is currently in development.

Table 2: Keys to effective pregnancy diagnosis

1. Have accurate AI dates and/or bull turn-in and -out dates available at diagnosis.
2. Preg-check when longest-bred cows are 90 days past breeding.
3. Have accurate identification of cattle.
4. Have good functional facilities with cows sorted.
5. Have adequate, qualified, quiet help to work the cattle.

done at home. Similar to the send-in test, the blood sample will be drawn from the cow and placed in a tube. The tube has a purple top, as opposed to the red top of the normal tube, to signal that it contains an additive that is different from the send-in test. The at-home test clot tube has different agents that react to the proteins in the blood. Within 90 minutes the test will turn the solution blue to indicate the cow is pregnant or clear to indicate she is open.

“The test designed by Monsanto was actually old biology,” Lucy says. “Looking at the blood and picking up on the earlier signal will theoretically be able to pick up on pregnancies earlier. We tested over 1,000 of these samples last year and had very good results.”

Lucy speculates that once someone is able to improve the marketing and better develop the kits used in testing, the technology will become commercially available.

Advantages

Taking blood samples is not only a quick and easy way to detect pregnancies, it's also very convenient for producers.

“This is a huge advantage in rural areas where it's difficult to get vets to come out,” Lucy says. “Using pregnancy blood-testing can make some veterinarians nervous; preg-checking can be a big part of their business. But we are seeing fewer large-animal vets, and people need to get things done. The real advantage for producers is they can preg-check on their time. If the vet only checks on Tuesdays, producers don't have to work around that schedule. They could get a rainy day when they cannot get into the field to work crops, decide they want to preg-check their cows and just go do it.”

In addition to being more convenient for the producer, blood-testing can also be helpful for labs, Coover says, explaining that a lot of the producers they do embryo transfer (ET) for want them to come back soon after to preg-check the recipients. But the farms can be several hours away.

“We didn't have the time to drive all the way to their farm,” he adds. “Now I just tell them to take a blood sample and send it to me, and they can have results in one to two days.”

Looking at the test results and keeping the data can show more than just if the female is pregnant or not.

If a producer artificially inseminates a cow, then waits 15 days before turning the bull out, the test can be used to determine if the calf was sired by AI or natural service, Coover says. The test must detect the PSPBs only produced when the placenta is attached to the uterine wall, he explains. If the test shows a cow pregnant at 30-35 days, the calf must be from the AI service and not the natural service.

The test can also detect abnormally high pregnancy losses, Coover says. “If the animal has a history of pregnancy issues, you can test her at 30-plus days and know for sure if she is pregnant. Later on, if she does not calve on her due date or at all, you have cause to look into reasons for pregnancy loss (things like disease, nutrition, etc).”

Poock says that palpation and ultrasound scanning are still viable tools to work with that can provide information that blood sampling cannot. Ultrasound scanning is the only way to tell the sex of a calf still in the womb, and it can also identify dead or abnormal fetuses by looking at heart rates (see Table 1 for complete comparisons).

Coover does see blood sampling becoming more popular in the future. “A producer gets a new set of heifers in and AI's them all,” he explains, citing one example of how the test could be used in a management scenario. “Wait 30 to 34 days, and pull blood. Those that are pregnant stay and the others are sold, pretty simple. It's another valuable tool in the toolbox.”

Missed pregnancies = missed dollars

The most important thing for a producer is to have a sure way of knowing if a female is pregnant. Incorrect pregnancy detections could cause an abortion in that female if trying to re-synchronize; or worse, there could be lost dollars from a cow culled that was actually pregnant.

“For our veterinary and reproduction classes, we need reproductive tracts,” Lucy says. “We go to the slaughterhouse and find several of the tracts we got were actually pregnant and incorrectly culled. Somewhere that was missed, people didn't know they

were pregnant, so they were sent off. People need a simple way to find out she is pregnant. It's a combination of competence and accuracy with no special equipment needed. Anyone can do it.”

“Most everyone I have worked with has been very happy with blood sampling,” Coover says. “A few of the guys said they didn't believe me and had some of their cattle show false heat, but turned out they were indeed pregnant and our tests were correct. This test is not perfect, but it shows they are pregnant or have been. This test is 99% accurate at detecting open cows. It's just an awfully good test.”

