



# Pregnancy-Checking Made Simple

*Pregnancy-checking with a blood test provides advantages to cattlemen.*

*by Heather Smith Thomas*

**T**here have been several tests developed using hormone measurements in blood or milk to confirm pregnancy. The one most commonly used today is a blood test developed by Garth Sasser at the University of Idaho. He discovered a protein produced by the placenta of ruminant animals, detectable in their blood, and founded a company called BioTracking. His blood test called BioPRYN (Pregnant Ruminant Yes/No) for cattle and other ruminants became commercially available in 2002.

Today there are now more than 40 labs around the world that handle the blood samples. One of those labs is Ag Health Laboratories in Sunnyside, Wash., run by Fred Muller.

#### **The blood test**

“This test is the result of 30 years’ research by Sasser,” Muller says. “The protein he discovered can be detected in any pregnant ruminant — sheep, goats, bison, elk, deer, etc. The test created is being used a lot in bison and elk, as well as

cattle. He called it pregnancy-specific protein B (PSPB).”

Advantages of the blood test over palpation, which traditionally is the most-used method of pregnancy testing, include being able to detect pregnancy a little sooner [as early as 28 days after breeding or 32 days post embryo transfer (ET)] and offering better accuracy than rectal palpation if the palpator is not proficient. A blood sample can be obtained quickly and easily from a vein under the tail with less trauma and risk to the animal.

The BioPRYN test is very accurate on heifers and on cows that are at least 73 days past calving. If checked too soon after calving, cows will still have some PSPB present in the bloodstream, which could result in a false positive. If a cow was bred soon after calving (some cows cycle again in less than 50 days postcalving), cattlemen should check her at least 73 days postcalving to have an accurate test.

There are a few other tests that also check for a group of placental-associated glycoproteins (PAP). In the 1990s there was an effective test for identifying pregnancy in ruminants, but it utilized a complex and expensive technology called radio-immuno assay (RIA). It was used in elk and bison but was not cost effective for cattle producers.

"In 2000, BioTracking started using the newer ELISA immunological tests, and this made the blood test affordable for a commercial cattle operation," Muller says. The blood test became available for use as a commercial test in late 2002.

### Benefiting from the blood test

"BioPRYN is a great tool for herds that don't have a nearby veterinarian, or small herds if it might be inconvenient and/or expensive to have a vet come check a small group of cows," Muller says. The mountain states and other regions where ranches are spread out and far from veterinary services don't always have easy access to a veterinarian to do ultrasound or palpation.

"Some farms and ranches don't have a good set-up to be really efficient for doing pregnancy testing, and it becomes expensive to have a vet do it. When we first offered these tests we did a lot of dairy cattle because it's easy to draw blood from a cow in a stanchion, and didn't think it would really fit in the cow-calf world because most ranchers want to sort the open cows off [to sell] at the time they are checked," he adds.

Many large ranches still sort off culls at preg-check time, but in

some cases there are opportunities to utilize the blood test and to wait a couple of days for results. A growing number of ranchers are preconditioning calves, which means they are giving pre-weaning vaccines. If cows are preg-checked at that time, the open ones can be sold later, after the calves are weaned.

The blood test may be economical for small herds since it is cheaper to draw blood and send it off than to have a veterinary charge for a farm call as well as for palpation or ultrasound.

"When you look at average herd size around the country, there are many states where the average herd is less than 40 cows," Muller says. "Even in the West, herd numbers are surprisingly low. In Washington, for instance, the average beef herd is under 30 cows. In Nebraska, the eastern half of the state only averages 40 cows per herd."

Muller and Sasser spoke at a reproductive efficiency conference in Nebraska about BioPRYN. "Other speakers talked about the value of pregnancy testing and how to become more efficient with reproductive programs in cattle, and mentioned the large number of beef cattle that are not getting pregnancy checked," Muller says. "The most recent National Animal Health Monitoring System data listed the percentage of beef herds being pregnancy checked at between 18-20%. This is extremely low. If you count people who preg-check their own cows or have a technician palpate them, the number might be closer to 30%, but this still means 70 to 80% of beef cows are not getting checked by any method. The number one factor in whether ranches are profitable is winter feed costs. Why

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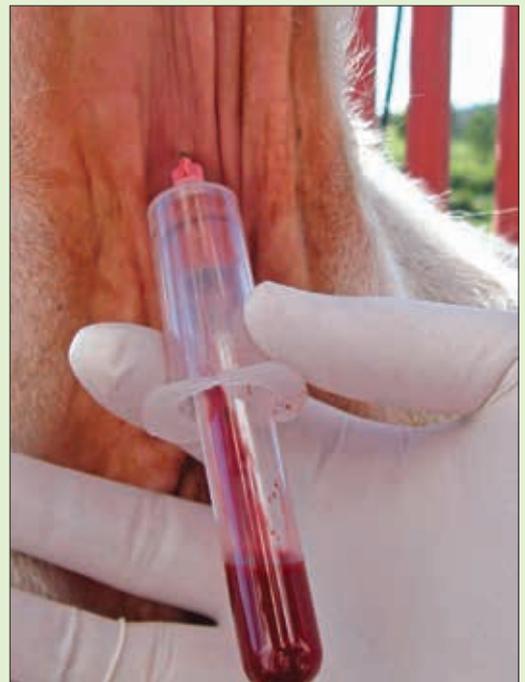
## How to take a blood sample

"It is easy to insert a blood-collection needle into the midline of the hairless bottom side of the tail," says Fred Muller of Ag Health Laboratories in Sunnyside, Wash. "You simply lift the tail with one hand and insert the needle with the other." A video on [aghealthlabs.com](http://aghealthlabs.com) demonstrates how to take a blood sample from a tail vein.

"You place the needle into the flat area. There is a bump between each vertebra and a flat spot on the bottom of them. You want to be on midline, at that flat spot. Insert the needle until it stops, and then attach the red top blood tube, which quickly fills with blood from the vein. It is really quite easy after you've done it a few times," he says.

Each tube can be marked with the cow's number. The protein is very stable, so the samples do not have to be refrigerated.

"If people ask how to handle the samples we tell them to refrigerate the blood tubes until they are dropped off at the lab or shipped," Muller says. "They can be shipped with bubble wrap around the tubes to protect them. Other than during extremely hot weather in the summer, you don't need ice packs. The protein is stable at room temperature. You might protect the tubes from freezing. It's best to not freeze them and to not cook them at over 100 degrees." **HW**



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would anyone tolerate extra cost to feed cows that are not going to produce calves in the spring?”

For purebred breeders who have a small herd or who want to check a few cows now and then for management purposes, a blood test is handier than scheduling a veterinarian. “There may be three or four cows the owner wants an answer on, and it might be hard to get a vet out to palpate or ultrasound just a few cows,” Muller says.

The test is also helpful when cows are bred by artificial insemination (AI) and breeders want to know right away if their females were settled to AI breeding versus waiting until later and not be able to tell if they are pregnant from the AI or a clean-up bull.

“If you AI the cows, you can still put them with a bull in a couple weeks, but 30 days after they’ve been AI’d you can pull a blood sample

and know if they settled to the AI,” Muller explains. Any cow or heifer that settled to the AI breeding will be confirmed at that time by the blood test, whereas any that settled two weeks later to the cleanup bull wouldn’t show positive yet.

The blood test is handy in heifers not only because it lets you know if they settled to AI or the cleanup bull but also because it allows you to cull the late or open ones earlier and to sell them at the peak of the market rather than waiting until fall.

“There is a lot of data on how much better those early-bred heifers will be as cows, and how much better they are at getting pregnant in subsequent years if they get pregnant early in their first breeding,” Muller says. “Heifers that conceive early in their first cycle with the bull or first AI breeding tend to get pregnant again at an earlier

date and are more productive throughout their lives. The ones that are late continue to be late.”

Muller says there is data showing that heifers that get pregnant early produce about 700 lb. more calf in their first six calves than heifers that breed late. “Give heifers an early window in which to become pregnant, and don’t keep breeding them for several months,” he says. Check them after a short window of time and sell the open ones.

“We suggest breeding heifers for no more than 65 days, or preferably 45 days, and then preg-check them in mid-summer, and sell the open ones in July when they are very valuable on that market, hitting ideal weight range for top prices. This could make more money than waiting until fall when they are bigger and their value has gone down. If you have grass and want to treat them as stockers you might

## Handy alternative

Jack Holden, Holden Herefords, Valier, Mont., has been using the blood tests for five years.

“We run about 400 cows,” he says. “About 250 are registered cows and the rest are commercial cows, mainly used as recipients. Often we use the blood test on our recipient cows, after we put embryos into them. This is a handy way to check them for pregnancy because we can do them at our convenience and it’s a simple thing to pull a blood sample. It’s nice to know early on, if they are pregnant, for sorting these recipis and putting embryos back into any that aren’t pregnant. With the blood test we can find out sooner than by palpation.”

Holden says he has also used the blood test on some of his registered cows.

“If there are times we get some in that might be short bred or just happen to be working them early,” he explains. “We still use the vet a lot for palpation on the main herd, and time it with other work, but the advantage of the blood test is that we can do it at our own convenience, whenever we want to. If we only have a few to do, and want to do them right away and not have to schedule a veterinary call, the blood test is a good option.”

He says the other advantage is being able to tell, within 30 days of being bred, whether the cow is pregnant or not.

“There are times we need to know, as soon as we possibly can, and this is cheaper and more convenient than ultrasound,”

he says. “With ultrasound you can tell fairly early, close to the same time frame, but you really have to search a bit for those early pregnancies. Even the good vets have to take a little time to look for those on ultrasound, to find a 30 to 35-day pregnancy. The blood test is simpler, and less invasive than rectal palpation or ultrasound.”

The economical cost of the blood test is also something Holden appreciates about the process.

“The blood test isn’t very expensive, about \$2.50 per cow, and the lab is very good about getting results back to us quickly,” he says. “From when I put the samples in the mail until I get the results is usually about 3 or 4 days.”

The turnaround time is the biggest disadvantage to the blood test when cattlemen need to know the status of their cows or heifers immediately. For those needing to make a decision regarding whether to keep or cull a cow when she goes through the chute — to determine whether to give her any vaccinations or other treatments or to just sort her off to be shipped — the blood test is not as useful. But if plans are to keep her around awhile before selling, the blood test would be a valuable option.

“For people who live where it’s harder to get a vet, or don’t want to have the vet come clear out to their ranch for just a few cows, the blood test is the best option.” **HW**



keep them, but many people get to August or September and are running out of grass. It would be better to pull the open ones off right away and sell them,” Muller says.

In a drought, ranchers could preg-check early if they don't want to continue feeding all the cows. “Maybe they want to early wean and preg check earlier. In a few instances people have used the blood test as a tool for sorting cows partway through the breeding season if a bull gets injured and must be removed from the herd. Rather than buying another bull to get through the last month, we've had clients who checked the cows with a blood test, grouped the pregnant ones in a separate pasture and left just the open cows with the remaining healthy bull,” says Muller.

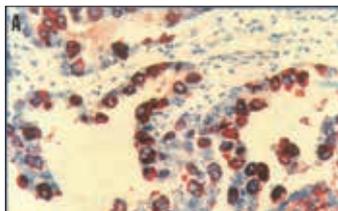
“Some people use it as their fall pregnancy test. There is no perfect test, regarding accuracy, but in many cases BioPRYN is more accurate than the people palpating cows.”

Being accurate on palpation has a lot to do with experience — how many cows a person palpates every year, how proficient he is — or how tired a person gets toward the end of a long day palpating several hundred cows.

“Some veterinarians are accurate and others are not,” Muller says. “We have heard complaints about some veterinarians, technicians and lay people not being accurate.”

BioPRYN's accuracy can be described a couple of ways. Sometimes it is stated as 97%, but a better way to describe it is to say that it is 99% accurate in identifying pregnant cows as pregnant and 95% accurate at identifying open cows.

“The 99% is a critical number because we certainly don't want to call a pregnant cow open. No one wants to accidentally cull a pregnant cow. The test is designed to identify pregnant cows as pregnant, which is called sensitivity. By contrast, the test is 95% on specificity (calling open cows open), which means in 5% of



At the lab where the blood test for pregnancy is processed, each blood sample is first separated — the serum or liquid portion (plasma) is separated from the solids (blood cells). The serum is checked for the presence of Pregnancy Specific Protein B (PSPB) using enzyme-linked immunosorbent assay (ELISA) technology to detect this protein, which makes it simple, quick and inexpensive. PSPB is produced by the placenta and will show up in the pregnant ruminant's blood as soon as the placenta starts to form in early pregnancy.

cows it might identify an open cow as pregnant,” Muller says.

In beef cattle, where cows are not as stressed as dairy cows and the fetus is usually older at the time of testing, specificity is much higher than 95%.

“The 95% number comes from dairies, in which high-producing animals are being checked in early gestation, where abortion rates and embryonic death are higher,” Muller explains. “Some of those cows probably were pregnant and still have residual PSPB and so the test calls them pregnant even though they show up open later. BioTracking has now run more than 5 million tests. Numbers are growing every year as more people learn about the technology and find ways to utilize it.”

Purebred breeders who use ET often prefer a blood test to check the recipient cows early on rather than to use something invasive

like palpation or ultrasound. If the recip cow isn't pregnant, they could re-use her before the end of the season.

“People tend to be a little more careful with a cow that is carrying a valuable embryo,” Muller says. “I find this even with my own cows. I palpate cows as early as 30 or 32 days' gestation for clients, but when I check my cow that has an embryo in her, I am cautious about palpating that early, with that small embryo, because I know there is some potential for traumatizing that embryo.”

Muller says there is data showing that 1-2% loss can be due to palpation. With a high-value pregnancy, it may be safer to take a blood sample instead. This sample could confirm that the recip cow is indeed pregnant, and she could be blood-tested again at 120 days if you want to make sure she is still pregnant. **HW**