ALABAMA COOPERATIVE Extension SYSTEM
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ANIMAL SCIENCES SERIES

TIMELY INFORMATION
Agriculture & Natural Resources

Annual Beef Cow Pregnancy Examination

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Reproductive efficiency is an important factor in determining the profitability of a cow-calf farm. A beef cow needs to produce a calf every year to be an economically viable member of the herd. An important management tool that is guaranteed to improve the reproductive efficiency of a beef herd is an annual pregnancy examination for every cow. By determining the pregnancy status of beef cows, producers can remove the reproductively inefficient cows from the herd which results in a combination of increased pounds of calf production per cow and lower costs per pound of calf production. In a herd with a defined breeding season, the identification and removal of open (non-pregnant) cows and replacement heifers allows more prudent utilization of valuable feed and pasture resources for productive animals. In addition, the culling of open, subfertile cows and replacement heifers improves overall herd fertility in subsequent years (Table 1), as well as improving pounds weaned per exposed cow and thus income per cow. Identifying open cows early provides more time for investigation and elimination of fertility problems associated with infectious disease, inadequate nutrition, poor bull fertility, and many other reasons before the next breeding season. Pregnancy diagnosis and fetal aging also allows you to group cows according to estimated calving dates to more effectively meet the management and nutritional demands of gestation, calving, lactation, and rebreeding.

Table 1. Improving overall herd fertility through annual pregnancy examination and culling of open, subfertile cows. Notice how the increase in herd fertility was sustained over the years by removing subfertile animals.

Pregnancy percentage by year

Herd	Year 1	Year 2	Year 3	Year 4	Year 5
1	75	97	96	93	98
2	64	56	84	89	
3	59	66	79	92	85
4	85	90	94		
5	82	94	93	93	
6	74	76	86	94	98
7	49	89	92	89	89

Source: Texas A&M AgriLIFE EXTENSION Publication B-1077

Increasing the percentage of cows pregnant results in a higher weaning percent which directly influences cattle performance and profits. Table 2 assumes an average feeder calf weight of 500-pounds per calf, various weaning percents (75%, 80%, 85%, 90%, and 95%), feeder calf production costs of $500 per brood cow, and $1.35/pound feeder calf price. As can been seen in Table 2, a higher weaning percent increases the average pounds of calf

production per brood cow (column 3). The higher the average pounds of calf production per brood cow, the lower the feeder calf breakeven price ($500/375 lbs. = $1.33/lb versus $500/400 lbs. = $1.25/lb., etc.). Note that feeder calf breakeven price is $1.33/lb with a weaning percent of 75%, but the breakeven price decreases to $1.05/lb if weaning percent increases to 95%. This represents a decrease in breakeven price of -$0.28/lb from the base ($1.05/lb. - $1.33/lb.). Correspondingly, the profit per brood cow was $6 and $141, respectively. This represents a difference, or an improvement in profit, of $135 per brood cow ($141 - $6) when weaning percent increases from 75% to 95%. For a one bull unit of beef cows (approximately 30 head) that equals $4,050 of additional income, which is the amount that the cattle farmer in this example could afford to spend to improve his weaning percent from 75% to 95%. Deducting the costs associated with increasing the cowherd's weaning percent from 75% to 95% from $4,050 will result in the total profit from improving reproductive performance. In short, an annual pregnancy examination is almost always an excellent dollar return.

Table 2. Feeder calf breakeven price per pound and profit per brood cow for various weaning percents[1].

Weaning Weight	Weaning Percent	Pounds Weaned per Exposed Cow		Feeder Calf Breakeven Price			Profit per Brood Cow	
(Lbs./Calf)	(%)	(Lbs./Cow)		($/Lb.)	($/Lb.)		($/Hd.)	($/Hd.)
500	75%	375		$1.33	-$0.28		$6	-$135
500	80%	400		$1.25	-$0.20		$40	-$101
500	85%	425		$1.18	-$0.12		$74	-$68
500	90%	450		$1.11	-$0.06		$108	$-34
500	95%	475		$1.05	Base		$141	Base

[1]Assumes an annual calf production cost of $500 per brood cow and average calf market price of $1.35/lb.

Despite all the benefits associated with beef cow annual pregnancy examinations, according to the February 2009 USDA National Animal Health Monitoring System (NAHMS) Beef Report only 10% of cow-calf farms in the Southeastern United States perform pregnancy examinations. Considering the cost of not identifying pregnant versus open cows, this is a tremendous opportunity to improve the production efficiency and economic viability of our cow-calf herds, especially considering the currently high input costs and high cull cow prices.

According to the USDA NAHMS Report, approximately 60% of the respondents that did not perform regular pregnancy examinations cited time and cost as reasons for not annually checking the pregnancy status of beef herds. However, pregnancy diagnosis is a procedure that pays for itself. Assuming a 50 cow herd at $5.00 per head for pregnancy examinations, a 90% conception rate, with a minimal $300.00 annual cow input cost and you spend $250.00 to save $1,500.00. If you can find the time and have a controlled breeding season, an annual pregnancy examination will pay for itself every time.

Methods for Pregnancy Examinations

The three most common methods for pregnancy examinations are rectal palpation, transrectal ultrasonography, and the BioPRYN® blood test (Table 3), with rectal palpation and transrectal ultrasonography being used over 95% of the time. When performed properly, all three methods are safe for the cow and the fetus. However, regardless of the method used to detect pregnancy status, a small proportion (~5%) of cows diagnosed pregnant prior to 60 days of

gestation will experience early fetal death, so keep that in mind when determining the best time to conduct pregnancy examinations. These early fetal losses are not a result of the pregnancy examination itself, but are 'miscarriages' that occur naturally.

Rectal Palpation

By far the most common method of pregnancy diagnosis in beef cattle, rectal palpation is a safe and accurate option for an annual beef cow pregnancy examination. Trained veterinarians can consistently and safely detect pregnancy as early as 35 days of gestation, and will rarely, if ever, misdiagnose a pregnancy after 45 days of gestation. Pregnancy diagnosis via rectal palpation provides more accurate information regarding fetal age if performed during the first 90 to 120 days of gestation. Given the accuracy, safety, speed, and cost of rectal palpation this is an excellent option for beef cattle pregnancy diagnosis.

Transrectal Ultrasonography

Transrectal ultrasonography allows for pregnancy diagnosis as early as 25 to 28 days after breeding. Early pregnancy diagnosis is certainly advantageous for a dairy cow and in some cases for a beef heifer, but is usually not as critical for a beef cow pregnancy examination. Ultrasonography provides the best evaluation of fetal viability (the fetal heart begins to beat approximately 21 days after conception) and the most accurate assessment of twin pregnancies. In addition, trained veterinarians can determine fetal age most accurately via transrectal ultrasonography between 25 and 90 days of gestation, and can determine the sex of the fetus with greater than 90% accuracy if the fetus is between 55 and 80 days of gestation. Determining the sex of a fetus may facilitate value-added marketing opportunities. Ultrasonography is the most costly method of pregnancy diagnosis.

Blood Testing

The most popular blood test for determining pregnancy in cattle is called BioPRYN®, which measures the presence of Pregnancy-Specific Protein B (PSPB) in the blood circulation of the cow or heifer. The placenta of the growing fetus produces PSPB, which can be detected in cow and heifer blood samples 28 days or more after breeding. However, cows must be 90 days post-calving to ensure accurate results, otherwise an open cow will likely be diagnosed as pregnant due to residual PSPB which has not cleared out of the maternal blood stream from the previous pregnancy.

The most commonly reported advantage of the BioPRYN® test is that it can be performed early in gestation (28 days post-breeding as long as the cow is at least 90 days post-calving) without a veterinarian. In areas with limited access to veterinary services, pregnancy diagnosis via blood testing may be the most convenient option. However, there are several disadvantages associated with the BioPRYN® test:

- There is a delay in receiving test results. Blood samples have to be collected, mailed to the laboratory, processed, and then results returned to the owner. The BioPRYN® test requires 27 hours from laboratory set-up to reporting. This will require working cattle a second time to separate the open and pregnant cows. Rectal palpation and transrectal ultrasonography provide immediate results.
- Blood tests do not provide any information about fetal viability, twins, or clues to why an animal is not pregnant. On the other hand, rectal palpation and transrectal ultrasonography provide an assessment of fetal viability and twin pregnancies as well as additional information in cases of poor fertility.
- The BioPRYN® test is advertised as being cheaper than rectal palpation, and in some cases the laboratory component of the BioPRYN® test may cost a little less than rectal palpation. However, considering all the costs associated with the BioPRYN® test, including blood tubes, needles, syringes, postage, laboratory costs, and additional labor to work the herd twice to separate the open and pregnant cows, there is no substantial price difference between blood tests and rectal palpation.

While there are certainly good reasons to use the BioPRYN® test for pregnancy diagnosis in some herds (especially if veterinary services are not readily available), most cow-calf farms will be better served with a veterinarian performing rectal palpation or transrectal ultrasonography.

Table 3. Comparison of rectal palpation, transrectal ultrasonography, and the BioPRYN® blood test for beef cattle pregnancy diagnosis.

	Rectal Palpation	Transrectal Ultrasonography	BioPRYN®
Accuracy of open diagnosis	++	++	++
Accuracy of pregnant diagnosis	++	++	+
Assessment of fetal viability	+	++	■
Detection of twins	+	++	■
Determination of fetal age	++	++	■
Determination of fetal sex	■	++	■
Results available immediately	++	++	■

+ = good
++ = better
■ = test can not perform this function

When is the best time to perform pregnancy examinations?
In most cases, waiting at least 45 to 60 days after the breeding season to conduct pregnancy examinations is recommended, but there are times when earlier pregnancy diagnosis is beneficial. The most practical time to conduct pregnancy examinations will vary from herd to herd, but keep in mind that other routine procedures such as vaccinations and deworming can also be performed at the same time. In addition, performing pregnancy examinations provides a great opportunity to evaluate other culling criteria such as feet and legs, eyes, age, health, disposition, teeth and mouth, udder, etc.

Conclusion
Reproductive efficiency is one of the most important factors in determining the profitability of a cow-calf farm. Especially with rising input costs, reproductive efficiency is more critical than ever. Fortunately, cull cow prices are also higher than they have ever been. Now is a good time to take advantage of these high cattle prices by finding the open cows in your herd, wean their calves early if needed, and prepare to sell the open cows when body condition and market prices are optimal.

Contact Dr. Soren Rodning (334-844-7502), your veterinarian, the Alabama Beef Cattle Improvement Association, and/or your Regional Animal Science and Forages Extension Agent to discuss the best time and method for annual pregnancy diagnosis in your herd.