



Cattle Producer's Library

Pregnancy Testing

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Pregnancy testing is a useful tool that can be used by producers to identify non-pregnant females. These females become likely candidates for culling since they will not produce a calf to offset production costs.

Pregnancy testing can profitably be used at two different times during the year. The first would be as early as possible (35 days by rectal exam) after the breeding season ends. The second would be in the fall when calves are weaned and before winter feeding programs begin. Pregnancy testing at this time would assure that only cows that are carrying a calf would be overwintered.

Pregnancy detection offers these advantages:

1. It gives early warning of breeding trouble, such as infertility in males and problem breeders in females.
2. It makes it possible to rebreed or sell non-pregnant females.
3. It allows for separation and grouping of females as pregnant and non-pregnant, which provides opportunity for proper management (i.e., nutrition, culling, and so forth).
4. It gives an operator an opportunity to use his facilities effectively at all seasons of the year, and particularly at calving time.
5. It makes it possible to guarantee pregnancy on females that are for sale.

Rectal Palpation

Pregnancy is routinely detected in cows by inserting the hand into the rectum and palpating through the rectal and uterine walls for fetal membranes, the amniotic vesicle, or cotyledons within the uterus. Well-trained persons can detect pregnancy 35 days after insemination, but accuracy is considerably improved by waiting until 40 to 50 days. Accuracy at 30 days is reduced, and a second examination is often required. Accuracy in pregnancy testing depends upon the ability to recognize

changes in the tone, size, and location of the uterine horns and changes in the uterine arteries. Fetal size and characteristics used in determining pregnancy are given in Table 1.

Ultrasound

Ultrasonic detection of pregnancy can be accomplished in cattle by inserting the transducer into the rectum and directing sound waves toward the uterus. Pregnancy has been detected during the second and third week after conception, but rate of detection is poor until the fourth or fifth week of gestation. White et al. (1985)¹ reported that, in 32 cows scanned at regular intervals between 20 and 140 days of gestation, pregnancy was detected with confidence at 30 days. The use of real-time ultrasound, where a moving image is displaced on a screen, is limited because of expense of the instruments. Traveling technicians can provide such a service, as is done for sheep, or animals can be moved to a central location.

Biochemical Tests

Biochemical detection relies upon a change in pattern of secretion of a hormone or detection of a new substance in the maternal system when an embryo is present in the uterus. This usually requires collection of body fluids for analysis. The steroid hormone called progesterone is secreted into the blood or milk at different rates depending upon the day of the heat cycle. It is high during most of the cycle and low at time of heat. If a cow conceives, it remains high until the end of pregnancy and is required at this level to maintain the pregnancy. If a

¹White, I. R., A. J. F. Russel, I. A. Wright, and T. K. Whyte. 1985. Real-time ultrasonic scanning in the diagnosis of pregnancy and the estimation of gestational age of cattle. *Vet. Record*. 117:5-8

Table 1. Fetal size and characteristics used in determining pregnancy.

Days of gestation	Fetal size		Identifying characteristics
	Weight	Length (inches)	
30	1/100 oz	2/5	One uterine horn slightly enlarged and thin; embryonic vesicle size of large marble. Uterus in approximate position of nonpregnant uterus. Fetal membranes of 30- to 90-day pregnancy may be slipped between fingers.
45	1/8 to 1/4 oz	1 1/4	Uterine horn somewhat enlarged, thinner walled, and prominent. Embryonic vesicle size of hen's egg.
60	1/4 to 1/2 oz	5 to 6	Uterine horn 2 1/2 to 3 1/2 inches in diameter; fluid filled and pulled over pelvic brim into body cavity. Fetus size of mouse.
90	3 to 6 oz	5 to 6	Both uterine horns swollen (4 to 5 inches in diameter) and pulled deeply into body cavity (difficult to palpate). Fetus is size of rat. Uterine artery 1/8 to 3/16 inch in diameter. Cotyledons 3/4 to 1 inch across.
120	1 to 2 lb	10 to 12	Similar to 90-day but fetus more easily palpated. Fetus is size of small cat with head the size of a lemon. Uterine artery 1/4 inch in diameter. Cotyledons more noticeable and 1 1/2 inch in length. Horns are 5 to 7 inches in diameter.
150	4 to 6 lb	12 to 16	Difficult to palpate fetus. Uterine horns are deep in body cavity with fetus size of large cat with horns 6 to 8 inches in diameter. Uterine artery 1/4 to 3/8 inch in diameter. Cotyledons 2 to 2 1/2 inches in diameter.
180	10 to 16 lb	20 to 24	Horns with fetus still out of reach. Fetus size of small dog. Uterine artery 3/8 to 1/2 inch in diameter. Cotyledons more enlarged. From sixth month until calving, a movement of fetus may be elicited by grasping the feet, legs, or nose.
210	20 to 30 lb	24 to 32	From 7 months until parturition, fetus may be felt.
240	40 to 60 lb	28 to 36	Age is largely determined by increase in fetal size.
270	60 to 100 lb	28 to 38	The uterine artery continues to increase in size: 210 days, 1/2 inch in diameter; 240 days, 1/2 to 5/8 inch in diameter; 270 days, 1/2 to 3/4 inch in diameter.

Source: Sorensen, A. M. Jr., and J. R. Beverly. 1979. Determining pregnancy in cattle. Texas Ag Ext. Ser. B-1077.

cow is bred and does not conceive, it declines as usual at the end of the cycle when heat is again visible.

Blood or milk progesterone test kits can be purchased to analyze level of progesterone. To use this kit, a single blood or milk sample is collected at 21 to 24 days after breeding and analyzed. If progesterone is low, the cow is called "not pregnant." If progesterone is high, she is called "pregnant." The reasoning is that if the cow has not conceived, she will have lost her corpus luteum at this time and progesterone will be low. She should be, or has been in heat, if low. Continued reasoning is that progesterone remains high if conception occurs.

Accuracy of calling the cow "not pregnant" (low progesterone) is almost 100 percent. Even if she were pregnant, she would abort with a low progesterone. Accuracy of calling a cow "pregnant" (high progesterone) is less than 85 percent. In this case, progesterone may be high at the time of assay because certain cows have shorter or longer estrous cycles or else an embryo is present, resulting in high progesterone, but then later it dies. This calls the test inaccurate, but in fact it isn't. The loss of the embryo contributes to the inaccuracy.

A substance, pregnancy-specific protein B (PSPB), which is produced by the placenta and is present in the blood of cows only during pregnancy, has been measured as a blood pregnancy test. The assay is only available in a laboratory setting. Blood PSPB can be measured reliably by 28 to 30 days until term pregnancy. The test was shown to be highly accurate when blood tests were compared to uterine content of slaughtered cows. In this case 99 percent of pregnant and 94.7 percent of non-pregnant animals were detected between gestation ages of 26 and 60 days. This test shows promise and development of a field test would be very versatile in cattle management.

Pregnancy testing is a popular management tool because it affords early pregnancy diagnosis with little hazard to the animal when the test is performed by an experienced operator. Cows should be pregnancy tested as part of the fall operation (after the calves have been weaned, and before cows are moved to the winter range). This practice will assure that only cows carrying a calf will be overwintered. Selling the open cows will save feed valued at \$50 to \$125 per head, depending upon the type of operation.



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