



Repro Tracks

► by **Bill Beal**, beef cattle reproductive physiologist, Virginia Tech

Pregnancy diagnosis: Is there a risk?

Pregnancy diagnosis is a common procedure used by cattle producers to manage reproductive performance and improve the economic efficiency of their herds. Use of rectal palpation to detect pregnancy includes the potential risk of causing embryonic death. However, the risk is reduced if pregnancy diagnosis is performed by a skilled technician, performed more than 50 days after breeding and done with the aid of ultrasound technology.

Breeder question No. 1

Is there a risk of causing embryonic death when my veterinarian palpates my cows for pregnancy diagnosis?

Response: Rectal palpation to detect pregnancy includes the potential risk that handling the reproductive tract could cause embryonic death. The potential risk is thought to be greatest when the cow or heifer being checked is fewer than 60 days postbreeding.

Pregnancy is detected by rectal palpation at fewer than 60 days after breeding by compressing the pregnant uterine horn between the palpator's thumb and forefinger and allowing the fetal membranes (placenta) inside of the uterus to slip between the fingers. Once the membranes have been detected, the amniotic vesicle, a fluid-filled sac surrounding the embryo, can be palpated as a "positive sign" of pregnancy. At Day 30, the vesicle is less than an inch in diameter and moves freely within the uterus. By Day 45, the amniotic vesicle is the size of a hen's egg. "Membrane slip" and accurate detection of the amniotic vesicle require skill achieved through considerable practice.

A recent experiment was conducted at Texas A&M to determine the effect of performing fetal membrane slip (FMS) for pregnancy diagnosis during early gestation on pregnancy loss (Romano et al., *J. Am. Vet. Med. Assoc.* vol. 239, pages 668–673). A group of 928 dairy cows were examined using ultrasonography (without manipulation of the reproductive tract) between Day 28 and Day 34 after breeding to verify pregnancy. Once pregnancy was verified, the pregnant cows were either assigned to be examined for pregnancy diagnosis via FMS by a board-certified veterinarian with 25 years of experience, or assigned not to be palpated.

At 45 and 60 days after breeding, the cows were re-examined with ultrasonography to determine if more embryonic death had occurred in those cows that were palpated for early pregnancy diagnosis. Pregnancy loss averaged 14.1% overall and was not different between cows that had been palpated by the experienced veterinarian (13.7%) and those that were not palpated (14.5%). Although the rate of embryonic loss in these dairy cows was greater than that reported for most beef cattle, the data suggest performing the membrane slip procedure and palpating the

amniotic vesicle do not create a greater risk of embryonic loss when performed by an experienced veterinarian.

Fig. 1: Ultrasound image of bovine fetus at Day 50 of pregnancy.



► Use of ultrasonography has been reported to decrease risk of fetal loss associated with pregnancy diagnosis.

Breeder question No. 2

Does the use of ultrasonography for pregnancy diagnosis or performing examinations later in pregnancy reduce the risk of causing embryonic loss?

Response: Examination of cows and heifers using transrectal ultrasonography has been proposed to reduce the risk of embryonic loss associated with pregnancy diagnosis. The reduced risk is proposed because the embryo/fetus can be visualized with ultrasound without manipulation or retraction of the pregnant uterus.

Deferring the timing of rectal palpation until more than 60 days after breeding allows pregnancy diagnosis to be done by detecting the fetus directly. Although it is less than 3 inches in length, the fetus at Day 60 can be detected by ballotment. Ballotment is the process of "bobbing" the fetus against the sidewall of the uterus so that it can be felt against the fingertips. The detectable presence of the fetus eliminates the need to handle the reproductive tract more aggressively to palpate fetal membranes or the amniotic vesicle.

Researchers at Colorado State University conducted an experiment to determine if fetal losses from pregnancy diagnosis between 42 and 72 days after breeding were affected by the stage of gestation at the time of diagnosis, the method of diagnosis (ultrasonography or rectal palpation), and the skill level of the technician (Table 1).

Table 1: Pregnancy loss following use of rectal palpation or ultrasonography for pregnancy diagnosis

Method of evaluation	Experience level	No. of pregnancies	No. of losses	% loss
Palpation	Novice	511	15	2.9%
	Experienced	843	10	1.2%
Ultrasound	Novice	552	7	1.3%
	Experienced	284	2	0.7%

Initial pregnancy diagnoses performed at 42-72 days; pregnancy loss verified after detection in estrus at 77-112 days.

Palpation vs. ultrasonography $P < 0.07$; novice vs. experienced $P < 0.06$; no significant interactions.

Novice = vet students in training; experienced = > 30,000 head palpated, >2,500 ultrasound evaluations.

Source: Richardson et al., *The Professional Animal Scientist*, vol. 26, pages 341-346.

Research revealed that regardless of the method used to diagnose pregnancy or the skill level of the technician, the risk of fetal loss was greater in heifers examined prior to Day 53 of pregnancy (3.5%) compared with heifers examined after Day 53 of pregnancy (1.3%). The loss of pregnancies was lower following examinations done by experienced technicians (1.1%) than following examinations by novice technicians (2.1%). Furthermore, the use of ultrasound to provide an image of the fetus (see Fig. 1), rather than to detect the fetus by palpation, reduced fetal losses for both the experienced and the novice technicians.

Some fetal loss will occur naturally, regardless of whether cows or heifers are examined for pregnancy diagnosis. However, the research results suggest that the use of skilled technicians and ultrasound imaging occurring later in pregnancy may reduce the risk of causing fetal loss associated with pregnancy diagnosis.

A handwritten signature in black ink that reads "Bill Beal". The signature is written in a cursive, flowing style with a large initial "B".

Editor's Note: *Bill Beal is a beef cattle reproductive physiologist and professor emeritus at Virginia Tech. He conducts research involving estrus synchronization, artificial insemination, embryo transfer and the use of ultrasound technology. This column is designed to provide answers to questions about reproductive management commonly posed by commercial and purebred breeders. If you have questions or comments related to the reproductive management of cows or bulls, email them to him at wbeal@vt.edu.*