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Milk progesterone kits: On-farm use

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Abstract

Diagnosing pregnancy in dairy cattle is an essential part of good management. The objective of this procedure is not to identify pregnant cows, but to identify the nonpregnant cows, those that become the breeding challenge. Economics dictate that verifying the pregnancy or "open" status of the cow is essential. Estimated losses of $1 to $3 per cow per day when conception is delayed beyond 85 days postpartum emphasize the importance of inseminating cows early to allow for 12 to 13-month calving intervals. A number of diagnostic tools are available and increasing scientific knowledge and technology will provide for improved pregnancy diagnosis in the future through use of cowside tests. These available procedures include: 1) continuous detection of estrus to identify inseminated cows that return to heat 18 to 24 days post breeding (repeat heats); 2) palpation of the uterus and its contents per rectum (sometime after day 35 of suspected pregnancy depending on the expertise of the clinician); 3) radioimmunoassays (RIA) of progesterone in milk, blood serum, and plasma; and 4) enzyme-linked immunoassays (ELISA) for progesterone in milk, blood serum, and plasma. At least five chemical cowside test kits are now available that use the ELISA-type tests for detecting progesterone in milk and one for blood serum in heifers (see reference 3).; Dairy Day, 1986, Kansas State University, Manhattan, KS, 1986;

Keywords

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MILK PROGESTERONE KITS: ON-FARM USE

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Background

Diagnosing pregnancy in dairy cattle is an essential part of good management. The objective of this procedure is not to identify pregnant cows, but to identify the nonpregnant cows, those that become the breeding challenge. Economics dictate that verifying the pregnancy or "open" status of the cow is essential. Estimated losses of $1 to $3 per cow per day when conception is delayed beyond 85 days postpartum emphasize the importance of inseminating cows early to allow for 12 to 13-month calving intervals.

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How They Work

Progesterone is a hormone that is produced by the corpus luteum (CL) or yellow body on the ovary. The CL develops from residual cells that remain at the site where the follicle ruptured on the ovarian surface and released the ovum (egg). Progesterone is secreted by the CL during the estrous cycle (detectable in milk or blood around 4 days after heat) and is present in milk or blood until the CL regresses (3 to 4 days before the next heat) or until the calf is born. Progesterone, as part of its normal metabolism and clearance from the blood, enters the mammary gland and is present in milk. The sampling procedure for the milk progesterone test relies on the fact that 21 to 24 days after insemination, concentrations of progesterone in milk, serum, or plasma will be low or nondetectable in cows that failed to conceive, whereas levels of progesterone should be comparably high in pregnant cows. A recent article described how the cowside milk progesterone works (see reference 1).

Accuracy of Cowside Tests

When the cowside test indicates low progesterone in milk 21 to 24 days after breeding, you can be about 90 to 100% certain that the cow is open, according to results of several studies (see reference 2). A high progesterone reading suggests that conception has occurred. The accuracy of detecting pregnant cows ranges from 68 to 95%, with an average of 84% (see reference 2). The reduced accuracy is because high concentrations of progesterone alone do not confirm pregnancy. Progesterone can be high (21 to 24 days after breeding) when cycles are abnormally long (>21 days) because of uterine infection and(or) embryonic death. Approximately 15 to 20% of all pregnancies are terminated prematurely by early embryonic death. Remember that progesterone is not unique to pregnancy, because it is secreted by the CL during the estrous cycle as well.

Things to Remember About Cowside Tests

The following important points should be remembered when using cowside tests: 1) follow the directions of each test kit exactly -- each is different, 2) continue to involve your veterinarian in your preventive herd health program (PHHP), 3) continue to palpate all cows for pregnancy even after a positive cowside test, and 4) remember that the best pregnancy test is a good heat detection program.

The most benefit from these cowside tests may be in supporting clinical findings of palpations per rectum. On occasion, it is difficult to determine the status of ovarian structures, especially follicular cysts. It is difficult for even the skilled clinician to distinguish between follicular (thin-walled) cysts and luteal (thick-walled) cysts. These cowside tests might be used to confirm the presence of luteal tissue, whether it be from a thick-walled luteal cyst or an indeterminant CL. In addition, weekly tests of low progesterone over a 3-wk period would indicate if a cow were anestrus (not cycling).

Cowside milk progesterone tests can be useful tools to both dairy producers and practicing veterinarians. They will not replace a comprehensive, reproductive, herd health program nor a good, heat detection program on the farm but can supplement them both. Several ideas for using these cowside tests have been suggested in other publications (see references 2 and 3).

Read More About It

1. Nebel, R. L. 1986. Here's how cowside milk progesterone tests work. Hoard's Dairyman 131(9):466, May 10, 1986.

2. Nebel, R. L. 1986. When should you use a cowside milk progesterone test? Hoard's Dairyman 131(11):566-567, June 10, 1986.

3. Nebel, R. L. 1986. Not all milk progesterone tests are the same. Dairy Herd Management, July, 1986, pp. 18-20.