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Cow-side milk progesterone testing

Abstract

Cow-side milk progesterone tests are effective in determining the presence of an active corpus luteum (CL) on the ovary. The test is best used as an adjunct to the Preventive Herd Health Program (PHHP) as a means of identifying cows that have not yet been detected in heat and are candidates for synchronization with prostaglandin (PGF). Several test kits are on the market, and all involve similar chemical principles. However, each test has its own protocol, so read and follow directions EXACTLY. A "control"? or "sample"? must be run with each test for comparison.; Dairy Day, 1987, Kansas State University, Manhattan, KS, 1987;

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COW-SIDE MILK PROGESTERONE TESTING

E.P. Call and J.S. Stevenson

Summary

Cow-side milk progesterone tests are effective in determining the presence of an active corpus luteum (CL) on the ovary. The test is best used as an adjunct to the Preventive Herd Health Program (PHHP) as a means of identifying cows that have not yet been detected in heat and are candidates for synchronization with prostaglandin (PGF). Several test kits are on the market, and all involve similar chemical principles. However, each test has its own protocol, so read and follow directions EXACTLY. A "control" or "standard" sample must be run with each test for comparison.

Introduction

Current technology provides procedures by which progesterone may be estimated in blood or milk. Since progesterone is the product of the corpus luteum (CL), such tests are of benefit in assessing the reproductive status of the cow, if the procedure is cost-effective, reliable, and conducive to on-farm use. Such "cow-side" tests are available and in use. Success or failure of the tests depends primarily on the way in which the results are to be used in management. For example, if the test is to determine pregnancy with an accuracy greater than 90%, the results will be disappointing. If the procedure is used to detect when a cow should be bred, the producer will be misled.

When To Use Test

Cows not yet bred. The greatest benefit of the cow-side test comes from evaluating the status of a cow not yet bred. For example, cows not yet serviced by 60 days or so after calving have the potential of not conceiving by 85 days. Since synchronization programs using prostaglandins (PGF) are effective if cows have functional CLs, a positive progesterone test would identify such cows. The alternative is to identify such cows via ovarian palpation per rectum. The economic benefits are savings of \$1.00 - \$2.00 per day for cows that are open 85 to 115 days. Also, the average herd calving interval may be reduced by one-half day for each day the interval from calving to first service is shortened.

Table 1 suggests the chances of identifying cows with an active CL based upon the stage of the 21-day estrous cycle. On the average, a cow will have positive progesterone 62% of the time. When a negative test is obtained, another test should be performed in 5-10 days. If the second test is negative, the cow should be examined per rectum to determine ovarian status.

Cows diagnosed cystic. Some cows have luteinized cysts that produce progesterone. If the cow-side test were positive, then PGF could be administered immediately. If the cyst were not luteinized, Gonadotropin-Releasing Hormone (GnRH) or Cystorelin® would be used, followed in 10 days with PGF.

Pregnancy diagnosis. Cows with a positive progesterone test 21-23 days after service have about 75% chance of having a terminal pregnancy. Conversely, cows with a negative test at the same time have a 95% chance of being open and should be watched closely for signs of heat. The lowered accuracy (75%) of the positive group results from embryonic abortion after 21-23 days and errors in heat detection at the time of the service. The economic benefit from the cow-side test 3 weeks after service would come from increasing heat detection pressure on those cows suspected to be open.

Heat check -- when to service. The cow-side test is NOT designed to determine the best time for servicing the cow. Remember — the cow-side test only indicates the presence or absence of a CL. Cows with a negative test should be observed closely for signs of heat. As noted in Table 1, an open cycling cow is expected to have low progesterone during 38% (or 8 days) of the 21-day cycle. Cows with low progesterone would be expected to have a functional CL within 10 days, but a cow-side verification test would be indicated before using PGF.

A Word About Synchronization

Using PGF to synchronize cows with active CL (positive progesterone) has been shown to be effective about 90% of the time. However, only one-half of the cows will be identified in standing heat within 3-4 days of PGF injection. These cows, of course, should be bred according to normal procedures. Those cows not detected in standing heat could be time bred at 72 and 96 hr after PGF. In rare cases, such cows may show heat symptoms 5-7 days after PGF and should be re-bred accordingly.

Table 1. Chances of detecting progesterone in milk in relation to to the stage of the estrous cycle in cows¹

Days of estrous cycle	% of estrous cycle	Progesterone in milk
1 to 4 days	19%	No
6 to 17	62	Yes
18 to 21	19	No

¹ Assumption is made that the cow is cycling and not pregnant.