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G86-818 How To Use the Milk Progesterone Tests

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How To Use the Milk Progesterone Tests

This guide discusses the basis for milk progesterone tests, using the test to confirm estrus, as an early indicator of pregnancy, and the availability and costs of kits.

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Milk progesterone test kits are now commercially available for on-farm use. Correct interpretation of the test results requires accurate estrous detection and good records. Properly used, these tests can help determine (1) if a cow is near estrus and potentially could conceive if bred, or (2) as an early indicator of pregnancy.

What is the Basis for the Milk Progesterone Test?

Progesterone is a female sex hormone commonly referred to as the hormone of pregnancy. The test is based on the expected **changes** in the production of this hormone during the reproductive cycles and pregnancy. Progesterone levels elevate during the midcycle of each reproductive cycle and during the entire gestation period. Since progesterone is produced by the corpus luteum (yellow body) in the ovary, high progesterone levels show a functional corpus luteum. The corpus luteum forms and produces high amounts of progesterone after the cow has been in estrus and ovulated (rupture of follicle and release of egg).

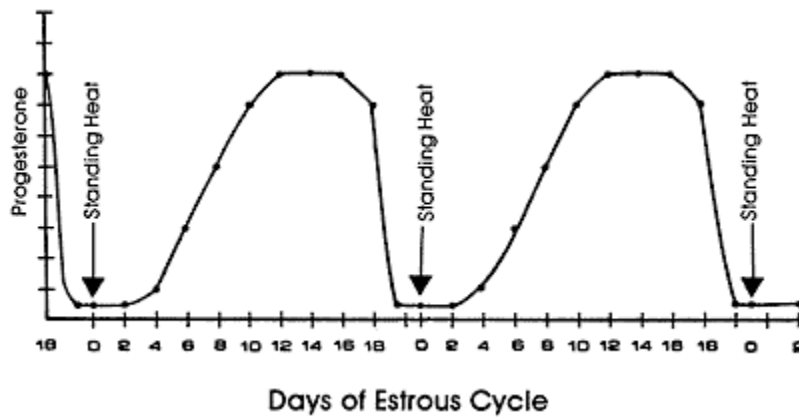


Figure 1. Progesterone concentrations in milk follow a cyclic pattern during reoccurring estrous cycles.

If the cow is not pregnant, the corpus luteum degenerates and progesterone levels decline to low levels about 2 days before the cow comes into heat again (*Figure 1*). However, if the cow becomes pregnant, the corpus luteum continues to function and progesterone levels remain high throughout gestation (*Figure 2*).



Figure 2. Progesterone concentrations in milk remain high continuously throughout pregnancy.

Therefore, if the cow is not pregnant and has regular estrous cycles, progesterone levels in the milk follow a cyclic pattern being low from about 2 days before heat until about 4 to 5 days after heat and about 4 to 5 days after heat and high during the middle portion of the cycle. Since progesterone is essential for the maintenance of pregnancy, it is continuously high in pregnant cows.

Using the Test to Confirm Estrus

Studies have shown that 10 to 20 percent of the cows inseminated were not in estrus at the time of insemination and consequently had no chance of conceiving. If there is a question about whether or not a cow is in estrus, a single milk sample can be collected from the cow and tested for progesterone. A high progesterone level would indicate that the cow is **not** in estrus and would not conceive if inseminated. A low progesterone level would suggest that the cow might be near estrus but cannot ensure that the cow is at the optimum stage for insemination. Therefore, the test is most accurate in identifying cows that should not be inseminated, because if the progesterone levels are high she cannot be in estrus.

Reasons why milk progesterone levels might be low include:

1. The cow is in or near estrus.
2. The cow is not cycling (inactive ovaries).
3. The cow is cystic (ovarian follicular cyst).

Using the Test as an Early Indicator of Pregnancy

To use the milk progesterone test as a pregnancy indicator the milk sample must be collected between 21 to 24 days after the cow was in estrus and inseminated. Low progesterone would indicate that the cow is not pregnant and high progesterone would indicate that the cow has a functional corpus luteum and might be pregnant. Therefore, the test is most accurate in determining that a cow is **not** pregnant, because if the progesterone levels are low she cannot be pregnant.

Reasons milk progesterone levels might be high between 21 and 24 days after insemination include:

1. The cow is pregnant.
2. The cow is in the middle of her estrous cycle but not pregnant due to:
 - o an error in estrous detection and the cow was bred at wrong time
 - o a longer than usual estrous cycle.
3. Embryonic mortality. The cow conceived but the embryo died.
4. Abnormalities, such as pyometra (accumulation of pus in the uterus or a dead, mummified fetus).

Availability and Costs of Kits

The milk progesterone test kits are available through veterinarians. The cost is expected to be about \$3.00 to \$4.00 per sample tested, depending on the number of milk samples tested at a time. The test can be performed on the farm, but the results need to be carefully interpreted to make proper management decisions.

Conclusion

The milk progesterone test is another management aid that can help to improve reproductive efficiency. To be successful, good records and estrous detection methods must be used. It is essential to recognize that progesterone is produced by the corpus luteum in the ovary and the levels do not specifically indicate if a cow is in estrus or pregnant. However, a cow with high progesterone cannot be in estrus and a cow with low progesterone cannot be pregnant.

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