Using progesterone analysis to assess your breeding program

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Scientists have utilized progesterone for many years to monitor breeding programs in dairy herds. Progesterone is a hormone produced and released into the blood by the corpus luteum (CL) on the ovary. The CL is formed after the follicle has ovulated (estrus) and is maintained for the nine months of gestation if the cow becomes pregnant. If conception fails, the CL regresses after 18 days and progesterone concentration falls, allowing the initiation of another cycle (Figure 1). Thus, progesterone is at low levels for non-cycling cows, and during the six days that surround estrus (d 20 to d 4) until the CL is producing sufficient levels of progesterone, which can be measured in both blood and milk.

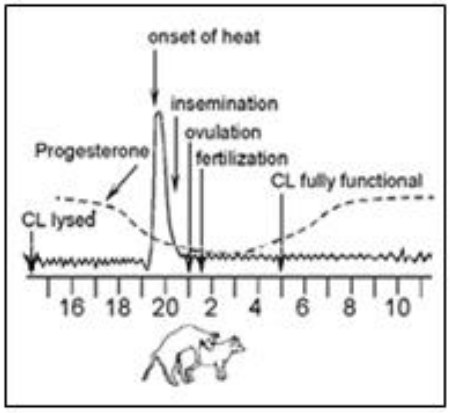
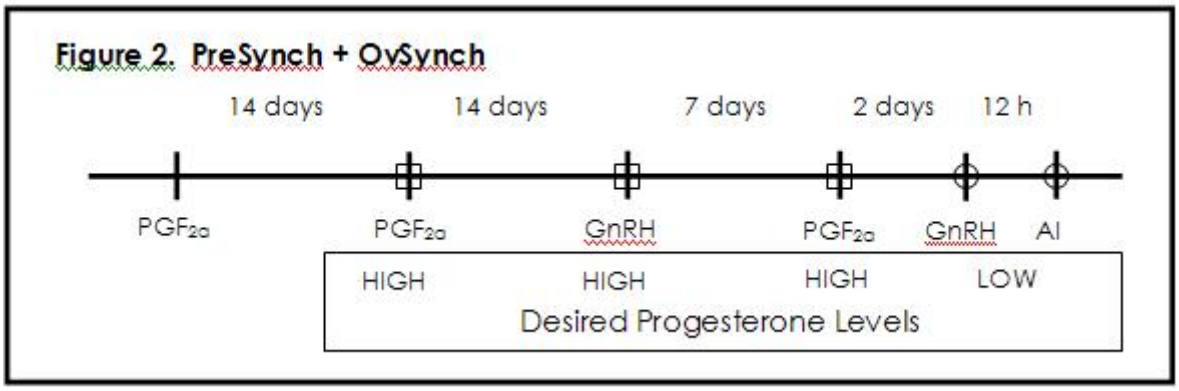


Figure 1. Estrus cycle near time of ovulation.

Progesterone testing, along with other factors, can be used as an evaluation tool to assess a herd's breeding program, especially in herd's using synchronization programs for artificial insemination. As an example, Figure 2 details the Presynch + Ovsynch program.

In any synchronization program, cows need to be cycling for the hormone injections to be effective in predicting or timing estrus for A.I. Blood or milk samples can be checked for progesterone levels at critical hormone injection points (•) when the CL is expected to be present on the ovary. At these points, progesterone levels are expected to be high (>3 ng/mL); low or undetectable levels indicate animals in which the synchronization program is failing, either because they are not cycling or they received improper hormone injections. Likewise, blood or milk samples can be checked for progesterone during predicted estrus, when the CL is expected to be absent. At these points, progesterone levels should be low (<3 ng/mL); high levels indicate an active CL and very little chance of an ovulation to coincide with the scheduled A.I.



To use progesterone testing to evaluate your breeding program, select 15 - 20 cows to sample at the three critical injection points and once during the predicted estrus period. The expectation is that the majority of animals will test "HIGH" at the critical injection points and "LOW" during estrus. This procedure can be conducted on specific groups (e.g., heifers) if lagging reproductive performance has been isolated to that group. Failure to observe a majority of the animals with expected levels of progesterone implicates improper synchronization as a potential cause for poor reproductive performance. Veterinarians and reproductive specialists can use this information to help identify underlying causes (anestrous, non-compliance with synchronization protocol, etc.) affecting responsiveness to synchronization programs. Based on the results of strategically collected samples, and knowledge of where in the synchronization program each cow should be, results indicating the relative progesterone level will be valuable in determining if synchronization programs are functioning as necessary to optimize future breeding results.