Troubleshooting breeding problems with Progesterone testing

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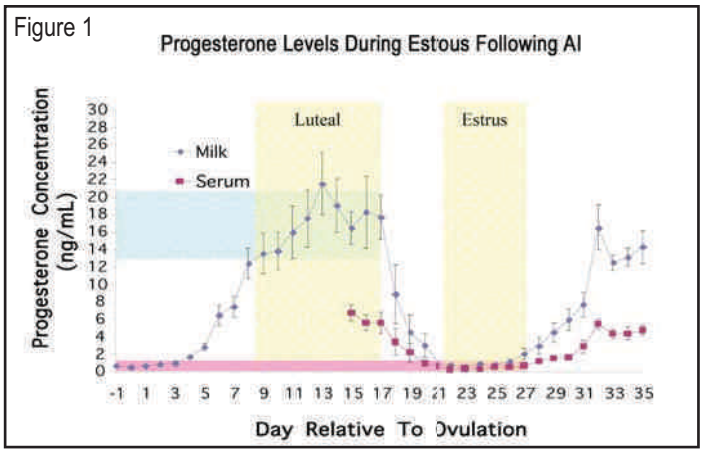
Current work at AntelBio is showing that progesterone testing is a valuable resource for dairy producers that wish to evaluate their timed A.I. synchronization and breeding programs. Julie Ainsworth, a NorthStar Dairy Production Analyst, recently enlisted progesterone testing to troubleshoot a breeding problem. With a pregnancy rate of 15 percent and a first service conception rate of only 22 percent, Julie suspected the herd wasn't responding to their Presynch/Ovsynch program.

Figure 1 shows progesterone levels in milk and serum during a cow's estrous cycle as determined during an intern study program supported by AntelBio and MSU's College of Veterinary Medicine. The results reveal two important points regarding progesterone and estrous cycles.

Figure 1



First, milk and serum progesterone levels are closely correlated, with milk progesterone three times the level of serum. Therefore, either milk or serum testing can be used to evaluate breeding programs. During the luteal phase of the estrous cycle milk progesterone concentration should fall within the blue range in Figure 1 (avg. 17 ng/mL). During estrus (heat) and at the time of A.I., progesterone levels in milk should be in the pink range (below 2 ng/mL).

Second, while high progesterone levels fluctuate markedly (large standard error bars) during the luteal phase of estrous, during estrus, the progesterone levels are very low and consistent (small standard error bars). Therefore, at the time of A.I., progesterone levels can be a precise estimator of synchronization efficiency. Although higher progesterone levels in the luteal phase fluctuate, they still reflect corpus luteum activity and levels in milk below 10 ng/mL were seldom observed during successful breedings.

Using this knowledge, an evaluation strategy was developed for the herd. Milk was sampled from 13 cows at three points during the Presynch/Ovsynch program and the results are reflected in Table 1.

Table 1

Cow	2nd PGF (Presynch)	PGF (Ovsynch)	A.I.
Desired Levels:	13-21 ng/mL	13-21 ng/mL	< 2 ng/mL
1	0.98	0.54	1.05
2	1.31	5.66	0.56
3	1.21	2.78	1.49
4	0.68	2.14	0.45
5	3.91	13.63	1.56
6	1.37	1.44	0.89
7	2.41	5.42	1.05
8	4.23	1.55	1.41
9	3.54	3.10	0.71
10	1.11	1.44	1.13
11	5.77	4.03	1.48
12	2.15	8.66	0.41
13	0.92	19.32	1.42
Mean±Std Err	2.28±0.44	5.36±1.53	1.05±0.12

A quick glance at the progesterone levels at A.I. might suggest that the synchronization program is performing satisfactorily with an average milk progesterone concentration of 1.05 ng/mL. However, similar results could also be expected from anovular cows. Progesterone concentrations during the synchronization program can be used to differentiate between the two possibilities.

For example, at the time of the second PGF injection of Presynch, when the majority of cows (80 to 85%) should exhibit typical high progesterone levels indicating cyclicity, this herd averaged only 2.28 ng/mL, suggesting cows were not cycling. None of the cows had desired luteal progesterone concentrations (17 ng/mL), and seven of the 13 show no evidence of an active corpus luteum (<2.0). Although cyclic activity improved at the time of the Ovsynch PGF injection, the levels are still not desirable with only two cows (5 and 13) showing signs of normal cycling. It can also be deduced from the results that cows 1, 6, and 10 (three of 13 for 23 percent) had not cycled at all during the 60-day voluntary waiting period.

Given the importance of pregnancies on the success of a dairy operation, a troubleshooting mechanism is invaluable to identification of timely corrective measures. The problem in this case appeared to be that the cows just weren't cycling. To determine why, this herd has been advised to focus on the adequacy of the close-up ration, cow comfort and the voluntary waiting period. When evaluations have taken place and recommendations have been effectively implemented, additional testing can be used to assess the success of the management changes. Stay tuned for more results.

Signs that your breeding program may be falling short:

- Low 21-day pregnancy rate
- Low estrus detection rate
- Long calving interal
- Low service rate
- Low percent pregnant at vet check

Progesterone testing is one more tool that can be used to help evaluate your breeding program. AntelBio offers progesterone testing via serum and DHI milk samples. For more information call 800.631.3510.

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