

# On-Farm Considerations for Early Nonpregnancy Diagnosis

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New reproductive management technologies hold the key to maximizing reproductive efficiency on dairy farms. However, reproductive protocols that allow for synchronization of estrus, and identification and resynchronization of nonpregnant cows must be practical to implement within the day-to-day operation of a dairy. Otherwise, the protocol will fail due to lack of compliance. This is especially true for larger farms that must schedule and administer artificial inseminations, hormone injections and pregnancy tests for a large number of animals on a daily or weekly basis.

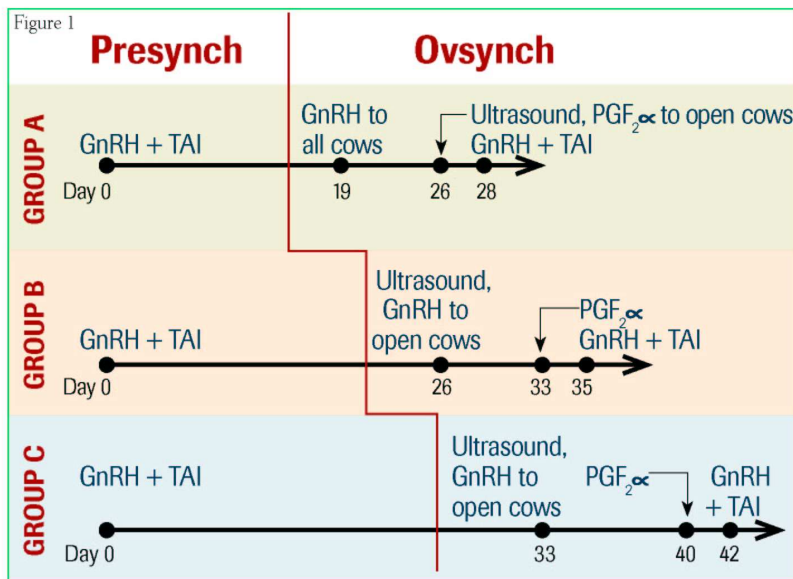
It has long been accepted that pregnancy status should be determined in dairy cattle as soon as possible after insemination, but without having the diagnosis confounded by later embryonic mortality. New research on the implementation of early pregnancy diagnosis using transrectal ultrasound in a synchronization and resynchronization system confirms this notion. Our research, below, illustrates on-farm considerations for early nonpregnancy diagnosis.

## Method of Discovery

Research included the use of two technologies for reproductive management - synchronization protocols (Ovsynch® and Presynch), and transrectal ultrasound for early identification of nonpregnant cows. The study objective was to compare conception rates from the first timed artificial insemination (TAI) service (Presynch) to conception rates following resynchronization with Ovsynch at three different intervals following Presynch TAI.

For the three groups, the first assessment of pregnancy status after Presynch and the initiation of resynchronization were not conducted at the same interval

(see Figure 1). The Ovsynch resynchronization protocol for Group A was started 19 days after the initial Presynch TAI and before the cows were ultrasounded for pregnancy diagnosis at day 26. For group B, pregnancy diagnosis via ultrasound and the first GnRH shot of the resynchronization protocol were both conducted on day 26. In group C, pregnancy diagnosis and resynchronization were conducted on day 33 following first TAI.



### Examining the Results

At the first pregnancy exam, the overall pregnancy rate for Presynch TAI was 40 percent (Table 1). The pregnancy rate was greater in groups A and B since pregnancy status was determined at 26 days after insemination. Group C, ultrasounded 33 days after insemination, had a significantly lower pregnancy rate. The lower pregnancy rate for group C is likely due to the longer time period in which embryonic mortality could occur (33 days from TAI to pregnancy exam, instead of 26 days).

Pregnancy status was reassessed for all groups at 68 days after Presynch TAI. This time, the overall pregnancy rate was 31 percent and did not significantly differ among groups (Table 1). This shows the differences in pregnancy rates between the first and second pregnancy exams were due to embryonic loss over time rather than to treatment differences

(ultrasounding at 26 days versus 33 days had no effect on pregnancy).

Overall pregnancy rate for resynchronization (Ovsynch TAI) was 32 percent, and was greater for cows in groups B and C than for group A (bottom row of Table 1). The data suggests waiting to diagnose pregnancies and to begin resynchronization until day 33 will result in significantly higher pregnancy rates when rebreeding nonpregnant cows because of the high rate of embryonic death occurring in cows diagnosed pregnant at 26 versus 33 days post TAI.

Table 1

Item	Treatment group			Overall
	A	B	C	
Interval from Presynch TAI to 1st pregnancy exam	26 Days	26 Days	33 Days	-
Pregnancy Rate (PR) at 1st pregnancy exam	46 <sup>a</sup>	42 <sup>a</sup>	33 <sup>b</sup>	40
Interval from Presynch TAI to 2nd pregnancy exam	68 Days	68 Days	68 Days	-
PR at 2nd pregnancy exam	33	30	29	31
Interval between pregnancy exams	42 Days	42 Days	35 Days	-
Pregnancy loss (%)	28 <sup>a</sup>	28 <sup>a</sup>	12 <sup>b</sup>	23
Mean interval ( $\pm$ Standard Error of Means) from Ovsynch TAI to pregnancy exam	27.1 $\pm$ 0.4	26.6 $\pm$ 0.2	33.7 $\pm$ 0.4	-
PR for resynchronization with Ovsynch	23 <sup>a</sup>	34 <sup>b</sup>	38 <sup>b</sup>	32

<sup>a,b</sup> Within a row, percentages with different superscripts differ ( $P < 0.01$ ) among treatment groups.

## Challenges for Early Pregnancy Diagnosis

Table 1 illustrates the limitations of incorporating early pregnancy diagnosis into a reproductive management program. First, the system with the most aggressive early nonpregnancy diagnosis and resynchronization schedule (group A) was not a viable management strategy based on poor fertility after resynchronization (23 percent pregnancy rate). This was probably due to follicular and luteal stages at the time the post-breeding resynchronization protocol was initiated. As stated previously, the data indicates diagnosing pregnancies and beginning resynchronization later will: a) not affect pregnancy rates from the initial TAI b) result in increased pregnancy rates during resynchronization.

### Item

**Author Bios:** Dr. Paul Fricke is an Associate Professor and Extension Specialist in Dairy Reproduction. His goal is to develop practical on-farm programs, based on scientific research, to improve reproductive efficiency. He conducts research on ovarian physiology and hormonal protocols in dairy cattle. Dr. Fricke's research has been published in numerous publications, and he has spoken for dairy audiences in several U.S. states and on five continents.

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