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Voluntary waiting period: How soon is too soon, and how late is too late?

By Ricardo C. Chebel, DVM, MPVM
Extension Veterinarian
University of California, Davis

Getting cows pregnant is probably one of the main challenges faced by the dairy industry. Cows that do not become pregnant at a reasonable interval after calving will linger in the herd, have increased days in milk (DIM), reduced milk yield, and if they do become pregnant at one point, will be dried off and calve overconditioned, which makes them more likely to develop post-parturient diseases in the subsequent lactation. However, on the other hand, cows that become pregnant too early after calving would be dried off too early in lactation when they are still producing a reasonable amount of milk.

The voluntary waiting period (VWP) is a time during early lactation in which cows are willingly not inseminated even if they display estrus, to allow for optimum uterine involution and recovery from negative energy balance. The VWP is quite variable across dairy herds, and in some herds it is variable according to parity and production level.

In recent surveys it has been observed that the average VWP in large dairy herds is between 50 and 60 DIM. However, because of poor estrous detection efficiency the interval from parturition to first artificial insemination can be considerably longer than the VWP. The advent of ovulation synchronization protocols that allow for fixed time AI with acceptable fertility has been a breakthrough in reproductive management of lactating dairy cows, reducing the interval between parturition and first AI by approximately 17 days.

"It is clear that although extending the VWP may result in increased first service pregnancy per AI, it does not necessarily result in reduced days open."

The debate about the optimal length of the VWP should be carried out and decisions should be made according to individual situations and after careful analysis of potential gains and losses. The idea of extending the VWP is based on the fact that during early lactation cows are still recovering from a dramatic state of negative energy balance and the fact that approximately 20 to 40 percent of lactating Holstein cows are anovular by 50 DIM.

Therefore, extending the VWP may allow cows to recover from a metabolic state that is deleterious to reproductive efficiency and display estrus a few times prior to first insemination, which has been correlated with improved fertility. Although, according to one study, extending the VWP in approximately 20 to 25 days (from 50 to 75 or from 75 to 100 DIM) resulted in greater first service pregnancy per AI, in another study the longer VWP had no effect on pregnancy per AI.

In both studies cited above, the proportion of cows pregnant at 200 or 305 DIM was not different for cows with short or long VWP, and the number of times that cows were inseminated over a 305-day period was not different when the VWP was approximately 50 compared with 73 DIM. Moreover, the number of days open was significantly greater for high producing cows (milk yield greater than 77 lbs/day) that had a 98 DIM VWP, compared with cows that had a 77 DIM VWP (123.2 ± 35.5 vs. 112.6 ± 39.2 d, respectively). From these data it is clear that although extending the VWP may result in increased first service pregnancy per AI, it does not necessarily result in reduced days open.

Because a large proportion of dairy operations rely on synchronization protocols for first

postpartum AI, it is important to keep in mind the economic impacts of decisions such as extending the VWP by submitting all cows to a fixed time AI protocol. Consider this scenario using a 5,000 cow-dairy with 500 fresh cows/month:

Option #1: If 100 percent of the cows are submitted to the Presynch/Ovsynch protocol for first postpartum AI (VWP = 71 DIM), over a

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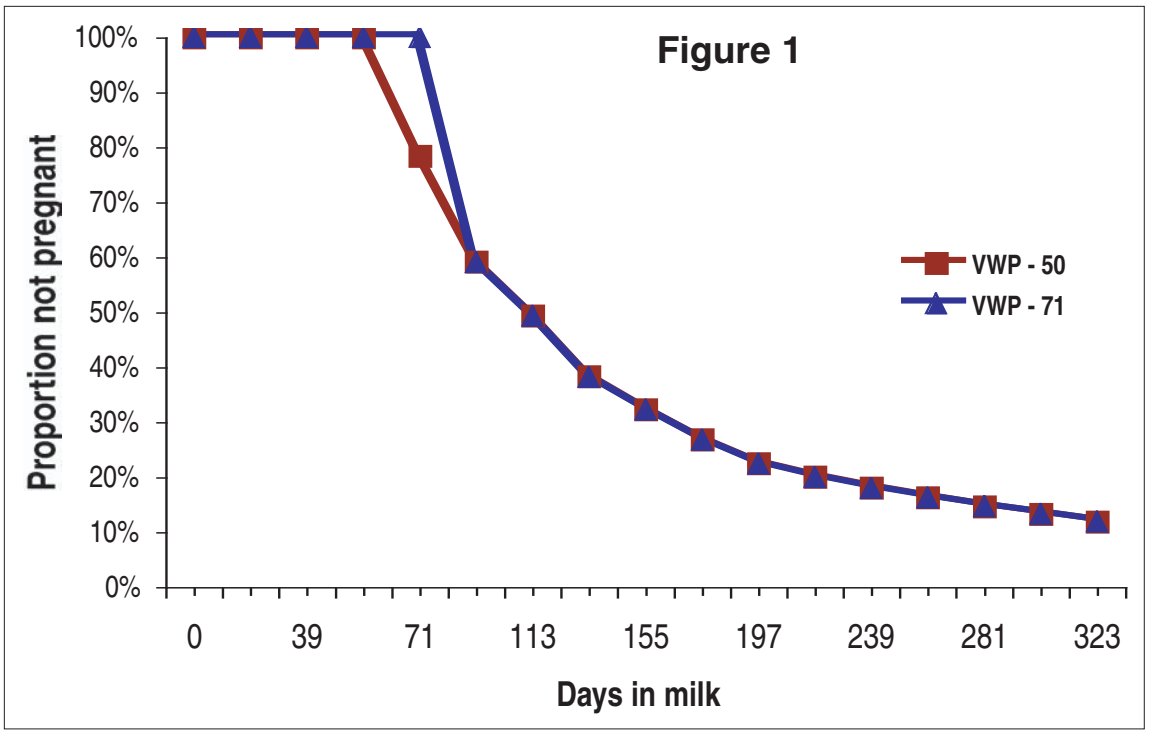

Voluntary waiting period . . .

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period of 12 months, the dairy would spend approximately $54,500 in drugs and labor for all first services (18,000 prostaglandin doses at $1.65/dose, 12,000 GnRH doses at $1.65/dose, 1 minute per injection at $10/hour of labor).

Option #2: If cows are inseminated after the second prostaglandin injection of the Presynch protocol (VWP = 50 DIM), and heat detection rate (HDR) is 60 percent from 50 to 70 DIM, only approximately 40 percent of cows would be submitted to the Ovsynch for the first postpartum AI.

Therefore, the cost with drugs and labor would be approximately $35,000/year for first service (14,400 prostaglandin doses and 4,800 GnRH doses, 1 minute per injection at $10/hour of labor). The savings for first postpartum AI in the second option would be $19,600/year if cows are inseminated on estrus following the Presynch and only submitted to the Ovsynch if not seen in heat.

You would be wise to ask: What about the reproductive performance of these cows? Some of the parameters of reproductive performance that we will discuss are: heat detection rate (HDR, number of cows inseminated divided by the number of cows eligible to be inseminated); pregnancy per AI (P/AI, number of cows pregnant divided by the number of cows inseminated); pregnancy rate (PR, number of cows pregnant divided by the number of cows eligible to become pregnant); and days open (interval from calving to pregnancy).

For calculation of HDR and PR we evaluate 21-day cycles, which is the length of the estrous cycle of the cow, starting at the end of the VWP. To illustrate the effect of changing VWP on reproductive performance, data from a commercial dairy herd with approximately 5,400 lactating cows in California will be used.

Currently in this herd, cows are inseminated following the last injection of prostaglandin of the Presynch (VWP ~50) and if cows are not found in heat within 14 days they are submitted to the Ovsynch. So in this case, cows that show heat after the Presynch are inseminated in the first cycle (50-70 DIM) and those cows inseminated following the Ovsynch in the second cycle (71-91 DIM).

Table 1 depicts the actual reproductive parameters of this herd according to DairyComp 305. From 50 to 70 DIM the HDR is 61 percent, the P/AI is 36 percent, and the P/AI is 22 percent; whereas from 71to 91 DIM the HDR is 70 percent, the P/AI is 35 percent, and the PR 24.5 percent. Therefore, after 2 cycles (from 50-91 DIM) approximately 41 percent of the cows in the herd are pregnant and the average days open is approximately 110 days.

Consequently, if the VWP is extended to 70 DIM and 100 percent of the cows are submitted to the Ovsynch protocol before insemination, the P/AI would have to be 41 percent in order for a similar proportion of cows to be pregnant by approximately 91 DIM (Figure 1). If after extending the VWP to 70 DIM, P/AI remains the same as when VWP was 50 DIM, then a smaller proportion of cows will be pregnant by 91 DIM (i.e. 41 vs. 36 percent) and days open will be extended to approximately 123 days (Figure 2).

Therefore, although extending the VWP may be useful in specific situations, significant increases in P/AI following first postpartum AI must be achieved to maintain similar reproductive parameters to shorter VWP. Furthermore, to offset the increased cost with drugs and labor when 100 percent of cows are submitted to a timed AI protocol for first postpartum insemination, significantly greater P/AI should be achieved following first postpartum AI in order to reduce the days open.

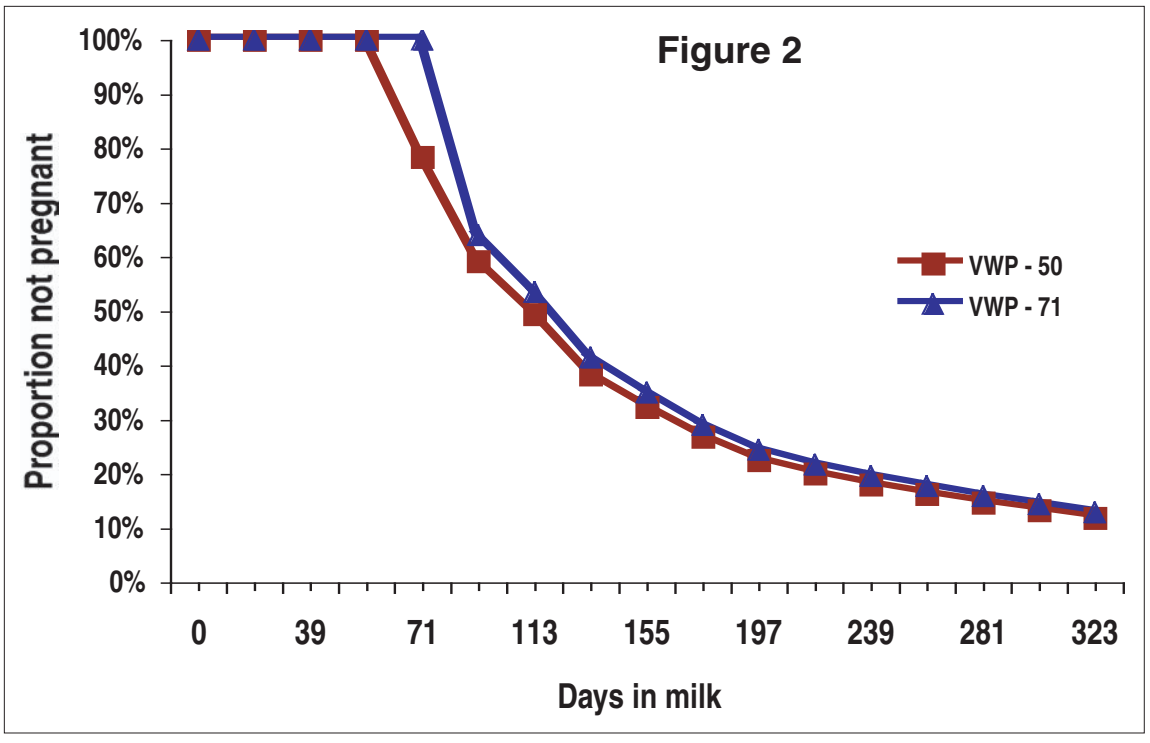
Table 1: Reproductive parameters of a California dairy herd in which cows are inseminated when observed in heat (VWP 50) and necessary heat detection rate (HDR), pregnancy per artificial insemination (P/AI), and pregnancy rate (PR) to maintain similar reproductive performance if voluntary waiting period is extended to 70 days in milk (VWP 70).

	(VWP 50)			(VWP 70)		
DIM	HDR	P/AI	PR	HDR	P/AI	PR
50-70	61%	36%	22%	–	–	–
71-91	70%	35%	24.5%	100%	41%	41%

Definitions:

Presynch – two injections of prostaglandin given 14 days apart, being that the last injection is given 11-14 days before the start of the Ovsynch.

Ovsynch – one injection of GnRH, followed 7 days later by an injection of prostaglandin, followed 48-56 hours later by a second injection of GnRH, and timed insemination 16-24 hours after that.



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For further information contact:
Dr. Ragan Adams, Editor
ILM, CSU-VTH
300 W. Drake Road
Fort Collins, CO 80523
970-297-0371
radams@lamar.colostate.edu