What is the ideal voluntary waiting period (VWP) for dairy farms?

Voluntary waiting period can be defined as the interval from calving to first postpartum breeding. The correct decision about the voluntary waiting period (VWP) is a critical step when setting up a standard operating procedure (SOP) for repro in a dairy farm. Then, it comes the question: what is the ideal VWP in my dairy farm? Well, as everything in life, the answer is not straightforward! For instance, the ideal voluntary waiting period for a given dairy will depend on several factors, including:

Factor	Reason
% of cows receiving timed AI at first postpartum AI	The more you rely on timed AI at first breeding, the more you can afford delaying first postpartum AI
Conception rate at first and later breedings	The greater conception rates are, the more you can delay VWP
Average interval between breedings	This parameter is highly correlated with overall service rate in a herd. The shorter the average interval between breedings, the longer you can afford delaying VWP
% of primiparous cows in the herd **(or average lactation persistency)**	Primiparous cows have greater milk production persistency and, normally, better fertility than older cows. The more primiparous cows, the more you can delay VWP
Intensity of summer heat stress	Several farms change their VWP in order to avoid the effects of summer heat stress on fertility, achieving greater conception rates at first postpartum AI

Interestingly, after studying several herd backups during my data analysis routine at Accelerated Genetics, I noticed three patterns as far as VWP approaches:

1) **100% heat detection**: farms relying on ~ 100% heat detection, working with relatively short VWP (~ 45 to 50 DIM);

2) **Back door approach**: Farms using shorter VWP (~ 45 to 50 DIM) breeding most of the cows based on heat detection, and using timed AI in cows not detected in heat by 75 to 80 DIM – strategy known as back door approach;

3) **> 80% timed AI**: Farms relying strongly on timed AI at first AI, generally using sophisticated pre-synchronization protocols (such as G6G, Double-Ovsynch, etc), and delaying first postpartum AI (~ 80 to 90 DIM) in order to achieve greater conception rates at first postpartum AI.

Regardless of the strategy used, the ultimate goal is to achieve average days open as close as possible to 110 to 120 days in most of the dairy farms. Also, we generally desire to have the least standard deviation as possible around 110 days open. In other words, in a perfect imaginary dairy farm, all cows ought to conceive at 110 DIM, which in most of the economical analysis, provides a good balance between average calving interval, milk production, and heifer replacement throughout the time. To achieve this goal, we would have to work with 100% timed AI with 100% conception rate at 110 DIM = as you all know, this is just not possible!

So what should I do?

Depending on the dairy, all the three above cited strategies to manage VWP can be successful. For instance, I visited several large high producing dairy farms in Middle East (> 3,000 cows in milk) that breed most of the cows based on heat detection. In general, some of these large dairies use timed AI in no much more than 5 to 10% of their cows. They have highly skilled technicians performing 24h surveillance for heat detection. Obviously, due to labor issues (etc), this model may not be applied in many dairies in US and other countries; but I can tell you that it works just fine in Middle East! Their preg rates are kept above 20% throughout the year – I can't argue with these numbers. In contrast, several dairies in Midwest (USA) rely 100% on timed AI, performing very few breedings out of visually detected heats (even less than 5% of the breedings!). Some of them are reaching impressive conception rates at first AI – up to 45 to 50% in first postpartum AI – believe or not, this is for real too!

These are successful stories, but sometimes things can go wrong, very wrong! For instance, these are the main weaknesses in each on the VWP approaches mentioned above:

1) **100% heat detection**: it is common to find a large percentage of the cows receiving first postpartum AI too early (less than 45 days) and too late (after 100 DIM) after calving. Also, lower conception results due to poor heat detection accuracy in quite frequent (employees just not prepared or overloaded with other tasks and not able to detect heat correctly). It is also common to find no SOP for repro in place at all.

2) **Back door approach**: I've seen some dairies performing neither heat detection nor timed AI consistently – they do both things and none at the same time! In Brazil, we I to say that "one dog with two owners may easily die of starvation sometimes". In other words, it takes more organization to work with this type of management, and a strong SOP must be in place.

3) **> 80% timed AI**: Although timed AI is a great tool and I actually spent most of my education trying to improve timed AI results in dairy cattle – it is frustrating to see that many dairies are not using this technology in the correct way. For instance, if your dairy does not have great conception results and if the average interval between the first 3 postpartum breedings is greater than 40 to 45 days, you better starting working with shorter VWP, and combine it with accurate heat detection between re-synch protocols in order to improve your pregnancy rates folks! Otherwise, you will get yourself spending tons of cash in hormones for timed AI and will be struggling with modest preg rate results of only 14 to 16%.

Following, I built a simple decision tree for helping farmers to decide about the best VWP for their dairies – this diagram is far from being perfect, but this is probably a good start to decide about your VWP. This decision tree is based on a weighted average between conception rate and service rate

performances in order to reach average days open of 110 to 120 days. Please let us know if we can help you to decide the right VWP for your dairy!

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                                    ┌─────────────┐
                                    │  Calving    │
                                    └──────┬──────┘
                                           ▼
                        ┌──────────────────────────────────┐
                        │ Can I afford having a fully        │
                        │ committed AI technician ready to   │
                        │ perform accurate heat detection?   │
                        └──────────────────────────────────┘
                         YES                            NO
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Can I afford having frequent (1/week) pregnancy diagnosis associated with timed AI or estrus synchronization protocols?

YES / NO

Am I ready to use timed AI protocols (organization, data keeping, good compliance, availability of hormones for a fair price, etc)?

YES / NO

Is my average interval between first 3 postpartum breedings less than 40 days?

You should probably work with short VWP (~ 50 DIM). Detect estrus with heat mount devices as many times as possible per day, and use timed AI in all cows not detected in heat by 70 DIM.

Is my average interval between first 3 postpartum breedings less than 40 days?

YES

You should consider using short VWP (~ 50 DIM) associated with aids for heat detection (Kamars, EstrusAlert, tail chalks, pedometers, etc). But, this will take some organization efforts. If not possible, you might want consider using bulls – which is fairly risky in both safety and sanitary standpoints.

NO

YES

Is my conception rate somewhat steady throughout the year and conception at 1st AI > 45% at 80 DIM and later AIs > 30%?

YES / NO

NO

You can probably afford delaying VWP to up to 80 to 90 DIM as long as you use 100% timed AI at first AI.

You should probably work with short VWP (~ 50 DIM). Detect estrus with heat mount devices as many times as possible per day, and use timed AI in all cows not detected in heat by 70 DIM.