



## Evaluating Herd Reproductive Performance

Even though many dairies have used Pregnancy Rate to evaluate reproductive performance for quite some time, restating the definition helps to focus on what information is needed for a thorough evaluation of a dairy's reproduction management. **Pregnancy Rate (PR)** is the percentage of cows eligible to become pregnant that actually do become pregnant. The data needs to be complete, accurate, and recorded consistently if we expect to show progress from one evaluation period to another.

Achieving high pregnancy rates (>20%) has benefits such as a lower average days in milk, and subsequently a higher percent of the lactation in the early phase.

There are other reproductive parameters that are often reported and used to measure management success or failure. Some do not show a complete picture and others have limitations that can lead to incorrect conclusions. A few can even influence us to make bad choices just to see the results reflected positively in the score or average. These calculated measurements usually serve a specific purpose and are valuable, as long as we understand them and we understand how they change when we make management changes.

**Days to First Service** appears to get top billing on some of the herd summarization reports that are produced at traditional Dairy Records Processing Centers. In theory, it can be an excellent indicator of management of the herd through the dry period, calving, and early lactation. Cows suffering a substantially slow return to estrous after calving may tell us that our transition cow program is not allowing cows to enter lactation properly prepared. High instances of metabolic disorders like ketosis or difficulty in calving may also delay estrous and drive that measurement higher. However, one real problem with this measure is that it only includes cows that have been serviced. We can overcome this problem with a very simple process. Perform a count of the cows that are not being included in the calculation. We only need 3 pieces of data to determine this- the voluntary waiting period (VWP), whether or not there is a service, and the days in milk (DIM) of the cow. As an example, you may want a VWP of 60 and therefore you might consider yourself successful if you service a cow by at least VWP + 21 (1 heat cycle) or 81 days. Simply count all cows over 81 days in milk without a service. Do this each month and a couple of things will happen. First you will know immediately if you have a growing problem. Knowing sooner means you can address it sooner. Secondly, when you service one of those cows and the average Days to First Service increases, you will not be disappointed by making the right decision. Unfortunately, the average increases when you take action, which is typically a poor indicator of success.

**Voluntary Waiting Period (VWP)** is a decision the dairyman makes for himself sometimes with the help of experienced professionals like veterinarians or AI service representatives. It can have a significant influence on the success of your reproductive program but not in the sense that you might think. Many producers set this value for 60 days and then monitor the Average Days to First Service to evaluate their success. They sometimes develop a mindset where they breed some cows early to make up for the ones that are bred late just to maintain the average. This is a classic case of failing the management plan on all cows, yet the supporting data average says you are right on target. Regardless, once you set a voluntary wait period, stick to it and address what is wrong if you have a growing number of cows not serviced beyond VWP + 21.

**Average Days Open** is the days from calving to conception. The main problem with this measure of reproductive performance is that it is an historical measurement that is not very sensitive to change. By the time you know it, there is little to do that will have any immediate impact. Days open is influenced by the voluntary waiting period, heat detection rate, conception rate, and overall herd health. The math is easy to do here. With average gestation somewhere around 280 days, your cows must conceive by 150 DIM to maintain a calving interval of 14 months or less.

**Calving Interval** is an indicator of past reproductive performance but lacks any indication of what is happening currently. This measure is also influenced by the voluntary waiting period, heat detection rate, conception rate, herd health, as well as days open and gestation period. It, like some of the averages above, can be misleading. There can be cows well beyond our goal that are masked by the cows calving sooner than our goal.

### Heat Detection Rate

Heat Detection Rate has the greatest influence on the Pregnancy Rate. There are 2 times that we typically think of when we consider heat detection. The first should be the time between the end of the VWP and when we service the cows hopefully 21 days later.

The second of course is 18-24 days after the current service should the cow not conceive. Overlooked however (because there is seldom any recorded data) is the importance of heat recording prior to the VWP. It is hard to discipline ourselves to observe and record what we are not planning to take action on. There are several obvious uses for such data. First, pre-VWP heat detection is important so that future heat target dates may be anticipated. Second, non-estrous cycling cows may be identified and treated prior to the VWP and thereby improving the percentage of cows we service by VWP + 21 days. Lastly, low pre-VWP heat detection rates may be related to problems of Transition like dystocia, milk fever, ketosis, displaced abomasum, retained placenta, and severe loss of body condition. Under normal conditions most healthy dairy cows will show at least one heat prior to VWP or 60 days in milk.



**Conception Rate** is the percent of cows that conceive for each time we service them. If we breed 20 cows and 10 of them become pregnant to that breeding, our conception rate is 50%. Another way to look at and calculate the overall conception rate for the herd is divide the actual services per pregnancy into 100. As an example, if you see that it takes 2.2 services on average to get a pregnancy then  $100/2.2 = 45\%$  conception rate. Like so many of the calculations we have talked about conception rate has a flaw as it only looks at cows serviced and is slow to make us aware that we may have reproductive problems

### Pregnancy Testing

Pregnancy Testing while not considered a reproductive management measurement to track performance of the herd can also influence Pregnancy Rate (PR) and most of the other calculations mentioned previously. Successful services resulting in a pregnancy do not change the PR regardless of the timing between breeding and the pregnancy testing since PR is related to the time the cow actually was serviced, and conceived. Open cows, and how soon we find them does have a direct influence on the PR for the herd. Knowing that the previous service did not result in a pregnancy helps us to identify cows for observation (heat detection) and possible intervention thus enabling us to re-breed the cow and shorten the time past the VWP that the cow remains open. Each time a cow fails to conceive at breeding increases the time she will spend in a less productive phase of lactation.

Achieving high Pregnancy Rates is a goal all dairies strive for. Once 20% PR was a lofty goal but technologies like Synchronization programs and activity monitoring systems have made us recognize that 30% PR and higher are a reality on many dairies. DHIA programs although typically thought of as the means to evaluate production, component, and udder health information, also plays a key role in evaluation of reproductive management. Professionals trained at recording heat, breeding and pregnancy data make it possible for dairies to evaluate reproduction when they do not use on-farm software themselves. Tracking Pregnancy Rate or any of the contributing calculations stated above is easy for computers so long as we are careful to be complete and accurate in recoding the data. Newer technology such as milk and blood pregnancy testing can have a positive impact on PR by offering convenient, more frequent pregnancy analysis to help address the open cows and re-service them in a timely manner.

If you would like assistance with test day reports to evaluate reproductive performance on your dairy, please contact your Dairy One Farm Service Technician.