

Top 10 Parameters to Monitor Reproductive Performance



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As the saying goes, you can't manage what you don't measure. Dairy producers put a lot of time and effort into reproductive programs, but effectively managing those programs requires performance measuring. Reproductive measurements and monitoring enable producers to make timely and accurate management decisions for improvement.

The GENEX logo, featuring the word "GENEX" in a bold, white, sans-serif font with a stylized cow head icon to the right.

The following are some of today's most commonly tracked, reviewed and discussed reproductive parameters, along with current performance levels in both Holstein and Jersey herds from the GENEX database.

1 Percent of herd pregnant by 150 days in milk (DIM).

If you want to pick one number to focus on, consider this one. It gives an accurate snapshot of the reproductive efficiency of a herd. This parameter is important because production of milk pounds and solids decreases in late lactation. Therefore, to maximize production efficiency, reproductive programs need to be effective and timely.

Factors that can limit the percent of herd pregnant by 150 DIM are numerous but may include: poor transitioning from dry to lactating, poor conception, infertility, disease issues, inadequate enrollment for insemination or low estrus detection.

Reproductive award-winning herds have achieved over 89% of cows pregnant by 150 DIM; with good reproduction, 75% should be a realistic minimum goal for a dairy.

2 Number of eligible cows beyond first service insemination deadline not inseminated.

No matter the protocols for insemination, no cows should "fall off the radar." A cow that does not get bred does not become pregnant.

It is important to have a fixed goal for DIM by which all cows should be inseminated – either by estrus detection, a synchronization program or a combination of the two. Sometimes cows are moved to non-breeding pens due to special needs or are missed for other reasons; monitoring this allows for identification and resolution of these issues. Zero is the goal here.

3 Cows' monthly conception by service number and lactation.

Monthly monitoring of first service, second service and overall conception for first lactation versus older cows can reveal potential opportunities for improvement. For example, first lactation cows with subpar average daily gains as virgin heifers may show decreased early service conception. In older cows, poor conception to first service may be related to dry period issues.

Difficult calvings and maternity issues may result in postpartum health events and lead to decreased early service conception across lactations. Later service conception may be affected by feed issues, mastitis, poor compliance on resynchronization or improper estrus detection. Stress from sources such as heat or overcrowding can affect all services.

Annual conception data on over 120,000 Holsteins in herds with 501 to 2,000 cows show first lactation cows averaging 47% conceiving to first service, 39% on second service and 41% overall. For older Holstein cows, the average conception is 39% on first service, 34% on second service and 36% overall.

Annual conception data on over 14,000 Jerseys in similar sized herds show first lactation cows averaging 47% conceiving to first service, 41% on second service and 42% overall. For older cows, the average conception is 44% on first service, 40% on second service and 41% overall.

4 Cows' monthly conception by breeding code.

Typical protocols being tracked are for standing heats, first synchronization and resynchronization. Many dairies have other codes listed to help the breeding team determine which programs are getting the best results. For example, herds with activity systems can have estimated time to ovulation broken into different codes.

Compliance and timing are the biggest factors affecting the success of synchronization programs. Cow fertility, semen quality and handling, and timely estrus detection are key factors across all codes. Modern synchronization protocols can enhance fertility as well as get anovular or cystic cows to cycle, so these programs potentially boost conception. Conception to standing heats is usually a bit lower than with these programs but can result in the same number of cows pregnant by 150 DIM.

What works best? It depends on labor, logistics, etc. If you compare to the conception data in section 3, is the conception on any code falling below expectations?

5 Three week pregnancy risk. This number is arrived at by multiplying the service rate and the conception rate. Therefore, the plethora of factors that affect estrus expression, estrus detection, and conception will affect this percentage.

Annual three-week pregnancy risk averages can be quickly compared to 120-day and to the last three weeks that are pregnancy checked to determine how reproduction is trending within a herd.

This percentage represents the effectiveness of the reproductive program for each three-week cycle over time. Be aware that some programs exclude “do not breed” cows, while others include them.

The top 25% of 500-2000 cow Holstein herds by cow pregnancy rate are averaging a 28.1% three-week pregnancy risk, while the top 25% by cow pregnancy rate of similar-sized Jersey herds are averaging a 29.8% three-week pregnancy risk.

6 Percent of heifers bred and percent pregnant at 15-17 months old.

This is a measure of the overall efficiency of the virgin heifer reproductive program. The range in age allows adequate time for breeding and pregnancy diagnosis (some dairies may narrow or lower the age range). Factors such as moving heifers into the breeding pen at or after the voluntary wait period, decreased fertility or inadequate heat detection will reduce these percentages. Delays reduce profitability by increasing the number of days (or months) heifers are fed before they begin to milk and return income.

The top 25% of Jersey herds by heifer pregnancy rate average 96% heifers bred and 75% recorded as pregnant by 15-17 months old. The top 25% of Holstein herds by heifer pregnancy rate average 97% heifers bred and 81% recorded as pregnant by 15-17 months old.

7 Virgin heifer monthly conception by service number and semen type.

Many producers use at least some sexed semen on early services in their heifers, so determining the conception to first versus later services by semen type is important. The same abundance of factors affects heifer reproduction as it does the adult herd reproduction.

The Dairy Calf and Heifer Association's Gold Standards II sets a goal of over 70% conception to first service with conventional semen. Expect 7-12% lower conception with sexed semen. Currently, the top 25% of Jersey and Holstein herds by heifer pregnancy rate average 52% and 57% overall conception respectively.

8 Percent of heifers fresh over 24 months old.

This represents the efficiency of the heifer rearing and breeding programs from nutrition and pen moves to heat detection and conception. Heifers that “slip through the cracks” raise the percentage and reduce profitability. Herds in the top 25% by heifer pregnancy rate average fewer than 15% calving after 24 months old, and this number gets a bit lower each year.

9 Percentage of abortions in heifers and cows.

Here, the term abortion refers to any cow or heifer recorded as pregnant who is then determined to be open without a calving event. A certain amount of early embryonic loss is to be expected, and herds with very early pregnancy diagnosis generally have a bit higher abortion rate. Diseases (such as Bovine Virus Diarrhea) and stress from heat and feed-related issues (such as mycotoxins) can impact this number significantly.

Annual averages for abortion events in the GENEX data set are: Jersey cows, 7%; Jersey heifers, 3%; Holstein cows, 9%; and Holstein heifers, 3%.

10 Percentage of stillbirths by lactation group.

This can be a reflection on maternity practices, personnel, genetics, disease or nutrition. All the resources used to obtain and maintain a pregnancy are for naught if the calf is born dead. First lactation heifers in both the Jersey and Holstein data sets average 7% stillbirths, while older cows in both breeds average 4% stillbirths. Herds with the best results in this area average 2-3% stillbirths annually.

Reproduction is affected by an abundance of factors from genetics to weather. Monitoring performance allows timely and accurate management decisions for herd reproductive improvement. ■