

Troubleshooting Reproductive Management of the Dairy Herd



Virtually everything done on the farm can impact reproduction. Nutrition, health, cow comfort, and heifer development are all important aspects of a dairy operation, and decisions are made about them daily. Those decisions need to be made with reproduction in mind. After all, if cows do not calve, they do not produce milk.

Many decisions about reproduction can affect the overall profitability of the operation. It is important to take a closer look at the factors involved directly with reproduction and to troubleshoot problem areas.

Three Steps for Improved Reproduction

The three main steps for improving reproduction are systematically evaluating the current situation, deciding if certain areas need troubleshooting, and then making and implementing decisions that will improve the situation.

Assess the current reproductive status.

To adequately assess the current situation, you must have usable records. It is difficult to know if the situation is improving if the starting point is unknown. Likewise, it is not easy to determine which areas need improvement if there are no records. Dairy Herd Improvement Association (DHIA) data, computer management software, or even barn records help in evaluating the current reproductive status.

Comparing your herd averages to regional averages or to “benchmarks” is an excellent way to get an idea of how your dairy rates with its peers. **Table 1** describes averages of dairy herd parameters in the southeast United States (Mississippi, Louisiana, Alabama, Georgia, and Florida). These averages can be used to see how your operation compares to those in the region. You can also compare your herd to others using DHIA data via Dairy Records Management Systems (www.drms.org).

It is also important to critically evaluate the cull rate for reproductive reasons. Ideally, the percentage of animals that

Table 1. Averages of reproductive parameters for dairy herds in the southeast United States.

Reproductive Parameter	Southeast U.S. Average
Pregnancy rate, %	14.2
First service conception rate, %	41.4
Days open	184
Actual calving interval, months	14.3
Days to first service	101.4
Services per conception (pregnant cows)	2.6
Percent heats observed, %	33.3

are culled specifically because of reproductive problems should be less than 8–10 percent. Even if values in other categories of culls are acceptable, a high cull rate due to reproduction indicates a problem that you need to address. Culling for reproduction also leaves fewer animals that can be culled for voluntary reasons. Culling voluntarily is the best way to improve genetic advancement while keeping replacement costs to a minimum.

After comparing herd averages to benchmarks, determine if there is a problem area that needs improvement. If there is a problem, looking back through the records can show when the problem started, the cause of the problem, and if some other management decision inadvertently impacted reproduction. Knowing when the problem started may also uncover whether or not it is a seasonal problem. Seasonal problems can be temperature or moisture related, but they might also be due to differences in diet or labor. If a certain group of animals, such as heifers, first, or two-plus lactation cows are affected more severely, target changes to that specific group. All these clues help determine a plan to improve the situation. In addition, carefully interpret your farm-level data. A low number of observations can lead to false conclusions. Although averages are important, distribution is key in determining problem areas.

Take a closer look at three general areas that impact reproduction.

If improvements need to be made, focus on three important areas of reproductive management: estrus (heat) detection, conception, and other factors.

Estrus detection:

- If the average days to first service are greater than 85 days in milk (DIM), or if few cows exhibit estrus less than 50 DIM, then think about the following questions. Is first service intentionally delayed? Are cows truly anestrus?
- When body condition (BCS) is evaluated, is greater than 15 percent of the herd too thin or overconditioned? The loss of 0.5 BCS between dry-off and calving or 1.0 between calving and 60 DIM is considered severe.
- Evaluate the percentage of the herd that has feet and leg problems and consider if the flooring is slippery; these can affect mounting activity and lessen the likelihood of visually detecting estrus.
- Is there evidence of severe uterine infections or debilitating diseases such as Johne's disease or ketosis?
- How many of the last 10 cows were bred on true heat, and how many were bred on secondary signs of heat? When, where, and for how long during the day are cows observed?
- Are specific individuals responsible for heat detection? Increase accountability by making one or two people responsible for heat detection. Are reproductive events recorded and displayed so that all employees know which cows to anticipate in heat? Make sure all employees understand the appropriate signs of estrus and that observation receives high priority. Feeding and other activities can sidetrack animals, making heat detection more challenging.
- Has a synchronization program been used, and used accurately, to induce estrus? Looking at the data in **Table 1**, only 36 percent of heats are observed; ideally, this figure would be 65 percent. This low estrus detection rate is why the average pregnancy rate is only 12 percent while the first

service conception rate is 48 percent. Estrus detection rate is factored into pregnancy rate and, to put it simply, more cows should be getting pregnant. Estrus detection should be a priority on any dairy operation.

Conception: Several factors can determine if a sperm is successful at fertilizing the oocyte and if the embryo is viable. Fertilization is nearly impossible to measure because a pregnancy cannot be detected until approximately 30 days post-insemination, allowing for 30 days for an embryo to die. Detection of conception at 30 days is actually less than the true conception rate. It is estimated that 60 percent of all pregnancies are lost in high-producing dairy cows, and most of these are in the first 42 days of pregnancy. However, thinking about the questions that focus on fertilization and conception, including spermatozoa and oocyte viability, is important.

- Is the timing of insemination appropriate (approximately 12 hours after the start of standing estrus)?
- Are you performing artificial insemination (AI) correctly? For example, are the semen tanks kept full of liquid nitrogen? Are the tanks and canisters labeled so that specific straws can be found quickly? Are the straws of semen kept in the lower portion of the neck of the tank when removing other straws? Semen should be thawed at 95°F for at least 40 seconds and loaded into a warm AI rod that is then kept warm. Cows should be inseminated in a clean and gentle manner, with semen deposited just beyond the cervix into the uterine body. A refresher course on AI techniques could help improve overall reproduction on your operation. The Mississippi State University Extension Service hosts an AI School twice each year (<http://extension.msstate.edu/content/ai-school>).

Other factors: Health, nutrition, and other factors can greatly impact reproduction. Here are some examples:

- Uterine infections and retained placenta can lengthen the time required for the reproductive tract to heal. The percentage of cows with these problems should be less than 10 percent each.

- If the abortion rate is abnormally high (more than 4 percent), this may indicate another disease or nutrition problem.
- The incidence of cystic ovaries should be less than 10 percent.
- The overall cleanliness of the cows can impact reproduction. Pay close attention to the herd bull, making sure he is healthy, vaccinated, and examined for breeding soundness on a regular basis.
- Evaluate the calving facilities: Are they clean, bedded, and well-ventilated?
- Discuss the current vaccination schedule with a veterinarian to make sure it is complete. Make sure heifers are vaccinated before first breeding and cows are vaccinated twice per year, including vibriosis (campylobacteriosis) if using a bull.
- Evaluate BCS of the majority of the herd at various stages of lactation and the dry period to assess the overall nutritional program. Determine how accurately nutrition programs are being followed. Are cows getting the quantities of nutrients they need?
- Examine feedstuffs for physical quality, particle size, sorting of feed, and the presence of molds or contaminants. Determine dry matter intakes and availability of bunk space. Obtain samples of forages, feeds, and total mixed rations (TMRs) for analysis. How often are cows being fed, or is feed being pushed up to the bunk as needed? Investigate using vitamin E and selenium for dry cows.
- Take samples for water quality, determine intake if possible, and make sure cows have adequate tank space. Consider adding water tanks for cows coming out of the parlor.

Decide if changes need to be implemented.

The third step in troubleshooting reproductive management is to decide if management decisions need to be made to improve reproductive efficiency. These management decisions depend on the issues uncovered in steps one and two. Always keep in mind the economics of these decisions. Would it be more cost-efficient to increase the number of cows that conceive per insemination or to maintain your current management practices?

One management decision that can greatly impact reproduction is the voluntary waiting period (VWP), or the time period between calving and eligibility for first breeding. It is tempting to shorten this time period, especially when an animal is in estrus. However, this is not advantageous because the cost per pregnancy is much greater soon after calving. Embryonic mortality is increased, which not only wastes money but also adds days to the next time of conception for that cow.

Many studies indicate that a longer VWP is better for reproduction and profitability. Generally, the absolute minimum VWP should be 60 days, with first-lactation cows 2 weeks longer than those in the second lactation or more. This is because first-lactation cows have a greater persistency in production, and they typically have a longer duration of negative energy balance. Ideally, at least 80 percent of cows will be inseminated within 21 days of the VWP.

Research has shown that when a VWP is consistent among low-, average-, and high-producing cows, the conception rate is similar. When the VWP is extended to 95 days for high-producing cows, their conception rate actually improved (42 percent) compared to low-producing cows with a VWP of 55 days (14 percent). This suggests the VWP is an important piece of the puzzle in getting cows pregnant.

Research also has shown a net return of 19 cents per day of the calving interval when the VWP is increased from 90 days to 150 days in first-lactation cows; a net return of 12 cents per day of the calving interval when the VWP of older-lactation cows is increased from 60 days to 120 days. These VWP lengths may be a bit drastic, particularly for seasonal dairies like many of those in Mississippi, but they do show that a longer VWP may be more profitable than you would initially suspect. Look at the economics of your individual operation to determine its ideal VWP. Consider making the VWP dependent on lactation and production, with about 75 days being the default.

Conclusion

Maintaining accurate and up-to-date records in usable form is essential in determining what areas of the operation need improvement and if the changes implemented work. Periodically review records to see if new trends arise, or if something obvious has changed. Perform a critical review of records each year, and follow along with the points in this publication to make sure you have considered all possibilities. Develop a checklist that is specific to your operation. Finally, determine if management decisions need to change in order to make improvements, and implement these changes. For more information on dairy herd reproductive management, contact your local MSU Extension office.

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Publication 2627 (POD-09-18)

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Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director