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DRY PERIOD LENGTH, FRESH COW HEALTH AND POSTPARTUM FERTILITY IN DAIRY COWS



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Skimming computer records in a dairy can give us a rough idea on the reproduction outcome just by looking at some average numbers. Unfortunately, average numbers are often times misleading when tracking specific fertility parameters that can be masked by other effects (season, breeding code, times bred, etc.). Likewise, average days dry, which may have tremendous impact on a series of metabolic events happening around calving, can have different interpretations depending on how deep we look and how we want to correlate them to fertility.

When looking at computer records during my regular reproductive troubleshooting for Accelerated Genetics' customers, I always like to verify the distribution of days dry. It is interesting to see the variation in length of dry periods among dairies. However, we should not worry too much about the final average. Instead we should look at their distribution (i.e. < 30, 30-45, 45-60, > 60 days dry) by lactation number. Then correlate this information with postpartum problems (proportion of displaced abomasum, retained placenta, milk fever, ketosis, metritis, conception at first A.I., etc).

For instance, we recently found a very strong relationship between days dry and milk fever in one of the dairies that we assist with reproductive evaluations through our *ReproConnections* program. We could not see this trend in regular postpartum health reports. Thus, in this article I'm going to explore the relationship among dry period length, feed intake, and some fertility parameters after calving.

IS THERE ANY RELATIONSHIP BETWEEN LENGTH OF DRY PERIOD AND FERTILITY IN DAIRY COWS?

There are very few randomized studies that tried to evaluate the effects of different dry period lengths on postpartum fertility. Gumen et al., 2005 used intensive ultrasound examinations and blood sampling to evaluate fertility of cows randomized and divided into one of three dry period groups:

- 1) Traditional dry period ~ 56 days
- 2) Shortened dry period ~ 28 days
- 3) No planned dry period

They found that dry period length affected days to first postpartum ovulation and average days open, as illustrated in Figures 1 and 2. These advantages for the no planned dry period group may be explained by an earlier peak of FSH in this group, which in turn was consequence of a positive energy balance because of higher dry matter intake, compared to the other 2 treatments (check original article for more details and other results.)

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Figure 1. Days to First Postpartum Ovulation by Days Dry.
Adapted from Gumen et al., 2005.

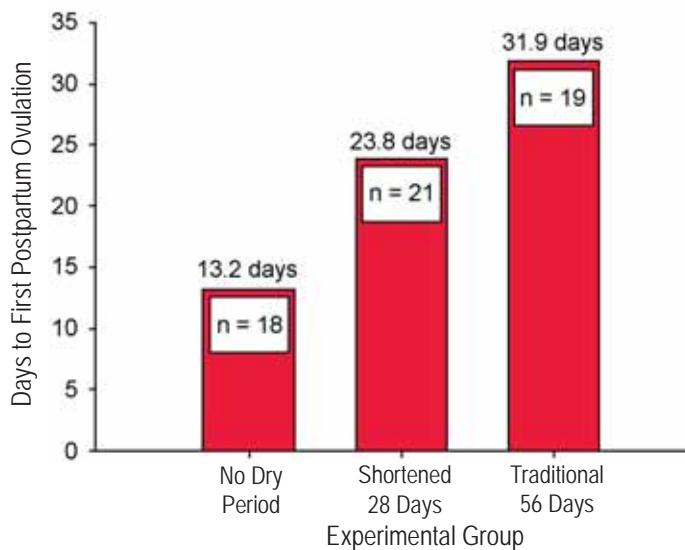
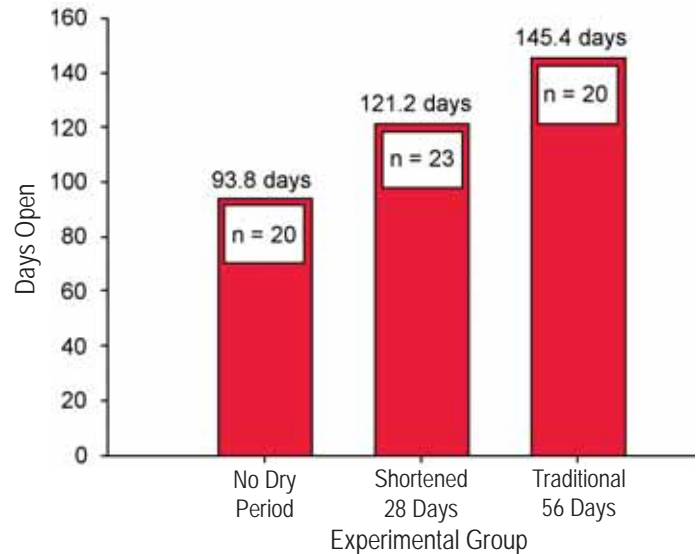


Figure 2. Days Open by Days Dry.
Adapted from Gumen et al., 2005.



Unfortunately, the limited number of experimental units in this research study does not allow us to draw final conclusions regarding conception rate results; however, this data gives us some insights that the length of dry period can definitely affect reproductive parameters.

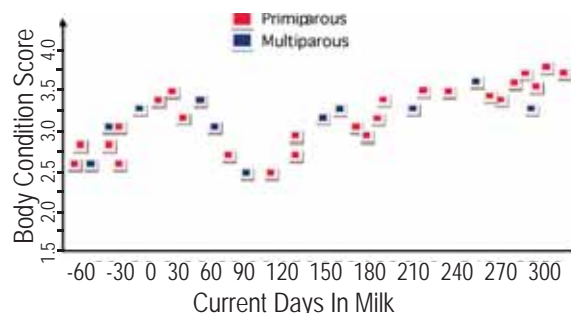
Although short dry periods seem to be a promising strategy, most research indicates that short dry periods might reduce milk production in the new lactation, particularly in primiparous cows (Annen et al., 2004). Another research group (Gillund et al., 2001), using data from several dairy herds, studied the association of different body condition scores (BCS) near calving, the proportion of cows presenting ketosis, and some fertility parameters. These authors found that cows with BCS > 3.5 were nearly three times more likely to present postpartum ketosis than cows with lower BCS.

As evidenced in other studies, Gillund et al., 2001 also supported the concept that this is probably the result of lower dry matter intake (DMI) in animals with higher BCS near calving. In agreement with that, previous studies found that cows with greater BCS near calving have lower DMI and lost more body weight after calving than thinner cows (Garnsworthy and Topps, 1982).

Gillund et al. also found that cows presenting ketosis lost more weight after calving and ultimately had lower

Figure 3. Observed Changes in Body Condition Scores Across Lactation.

Average pattern observed in lactating dairy cows.



conception at first breeding and longer calving to conception intervals. Therefore, it is always recommendable to follow BCS throughout lactation. In fact, monitoring BCS throughout lactation is a very effective tool to measure body condition loss after calving, as shown in the Figure 3, below.

WHAT IS THE IDEAL 'DAYS DRY' FOR CONFINED DAIRY HERDS?

Several research groups have studied this topic in the last decade. In general, they found that shorter dry periods tend to reduce problems related with negative energy balance (NEB), but lower milk production might be a concern when using short days dry (30 to 35 days) in primiparous cows.

Pezeshki et al., 2007 evaluated the effects of different days dry on milk production, milk composition,

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and energy balance of dairy cows. They used three dry period lengths 56 days, 42 days, and 35 days. Their data confirmed previous reports describing that cows in the short dry period had less problems with NEB. However, primiparous cows receiving the shorter dry period of 35 days produced less milk in the new lactation, in agreement with previous research (Annen et al., 2004).

Pezeshki's et al. data also argue that multiparous cows and cows with higher body condition scores (BCS) might benefit from shorter dry periods. Therefore, most of the research articles seem to recommend a 40 to 45 days dry for multiparous cows and 60 days for primiparous cows.

Less diet and pen changes around calving becomes one of the most important benefits of shorter dry periods. It is widely known that frequent diet changes may lead to lower DMI (Grummer and Rastani, 2004), and that cows with lower DMI near calving are more likely to have uterine problems after calving (Huzzey et al., 2007).

Huzzey et al., 2007 studied the relationship between feed and water intakes close to calving time and metritis rate in the postpartum period. These researchers used electronic equipment to measure feed and water intakes and cattle behavior in a group of 101 confined cows. All cows were evaluated from two weeks before calving until four weeks after calving.

Uterine infections were identified by inserting the arm with a palpation glove into the vagina, and uterine discharge was classified from 1 to 4. Rectal

temperature was also checked in all cows. Therefore, cows were classified with severe metritis if uterine discharge was equal to 4 and temperature > 39.5°C. Cows classified as healthy presented clear mucus (score 1) and no fever. Cows with mild metritis presented intermediate parameters (please check original article for further details).

Results from this study indicated that cows with severe and mild metritis had lower milk production during the experimental period. However, the most interesting finding was that feed and water intakes were strongly related with metritis after calving. It was clear that animals with either severe or mild metritis had lower feed and water intakes – even before calving!

They also observed that the cow's behavior was associated with metritis. In other words, cows with uterine infections were less dominant than healthy cows. It seems that one of the most effective ways to avoid postpartum problems (metritis, retained placenta, etc.) is by ensuring high DMI in the transition period. Thus, dairy producers should implement some management strategies to increase feed intakes and lower postpartum diseases, such as:

- 1) Keep first calving heifers separated from older cows in the pre- and post-partum pens.
- 2) Maximize feed and water intakes in the pre- and post-partum. Keep food and water available at all times!
- 3) Avoid overstocking in the dry and close-up pens. For instance, divide the number of cows in the pen by the feed

Picture 1. Having plenty of bunk space is important for prepartum COWS. (Picture by: Kari Stanek)



Picture 2. Clean, dry and well ventilated calving area. (Picture: Kari Stanek)



bunk space and pen area; avoid less than 30 inches of feed bunk space per cow, (i.e. Picture 1). Keep at least 30 square feet of bedded pack per cow.

4) In general, keep body condition scores at around 3.0 to 3.5 – no more or less than that.

5) Avoid changing cows to different pens around calving. Newly introduced cows will drop their feed intake until its hierarchy is established in the new pen.



6) Improve cow comfort as much as possible during dry period. Avoid heat stress and improve bedding condition. Calving area must be clean, dry and well ventilated, like in Picture 2.

7) Set up a consistent SOP for health checks in the early postpartum.

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