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Newsletter – January 2022

2022 Year Summaries

A 2022 year end summary of services provided (labeled "Treatments") and items purchased are included with your January 2023 statement. These summaries can be added to find the total veterinary cost billed for the year. If you did not receive one of these and would like one please e-mail ratticav@rochester.rr.com. *Please note this is NOT a separate bill to pay!*

Modulation of Inflammation during the Transition Period: Before or After Calving?

By: Adrian Alberto Barragan - Department of Veterinary and Biomedical Sciences, Penn State University

The transition period is a challenging time for dairy cows that encompasses the 3 weeks before calving until the 3 weeks after calving. During this period, cows experience three main physiological challenges:

1) A drop in dry matter intake and an increase in nutrient demands, which predispose cows to ***Negative Energy Balance***

2) ***Immunosuppression***

3) ***Systemic Inflammation***

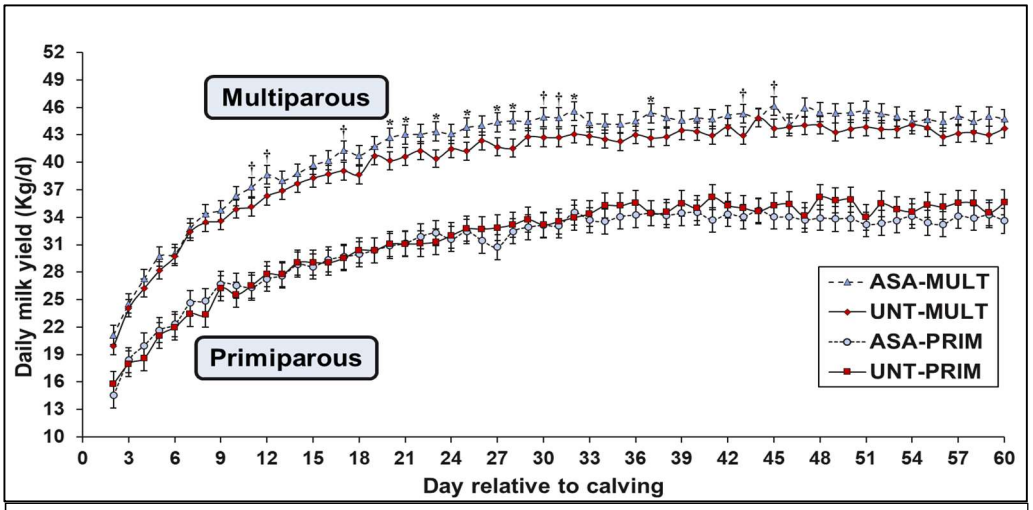

Figure 1. Daily milk yield (kg/d) in multiparous cows treated with acetylsalicylic acid (ASA-MULT; n = 76), multiparous cows that remained untreated (UNT-MULT; n = 81), primiparous cows treated with acetylsalicylic acid (ASA-PRIM; n = 38), and primiparous cows that remained untreated (UNT-PRIM; n = 36) after calving, for the first 60 DIM.

These three main challenges are interconnected and could cause or magnify each other. The triggering events of these processes are still not clear; however, recent research suggests that inflammation associated to the dry off process may be one of the main triggers.

Although anti-inflammatory treatment at dry-off has not yet been investigated, previous research suggests that this approach around calving may have benefits on cow health and performance. Most of the previous research has focused on using anti-inflammatory strategies in the first hours after calving. A recent study performed by our lab assessed an applicable and simple treatment approach (***aspirin boluses [200 mg/kg; 4 boluses of 480 grains] at calving and 24 h later***) and found not only benefits on milk production but also on cow metabolic status, uterine diseases and cow fertility. **Here are some of the main findings:**

- Second and greater lactation cows treated with aspirin produced 3.6 lbs/d more milk during the first 60 days in milk (Figure 1).
- All treated cows (first lactation cows and older) had lower concentration of ketone bodies at 14 days in milk.
- All treated cows had lower incidence of clinical metritis and endometritis.
- All treated cows required 20 days less to become pregnant.

Since most of the post-partum anti-inflammatory strategies proposed have found benefits on milk yield only in second or greater lactation cows, our lab designed a treatment strategy during the pre-partum period for first lactation cows. First lactation cows are the group of animals that have the highest inflammation and stress around calving, and often the group of animals that have the greatest incidence of diseases after calving. Although the inflammatory process during the transition period peaks around calving, it begins around two weeks before parturition.

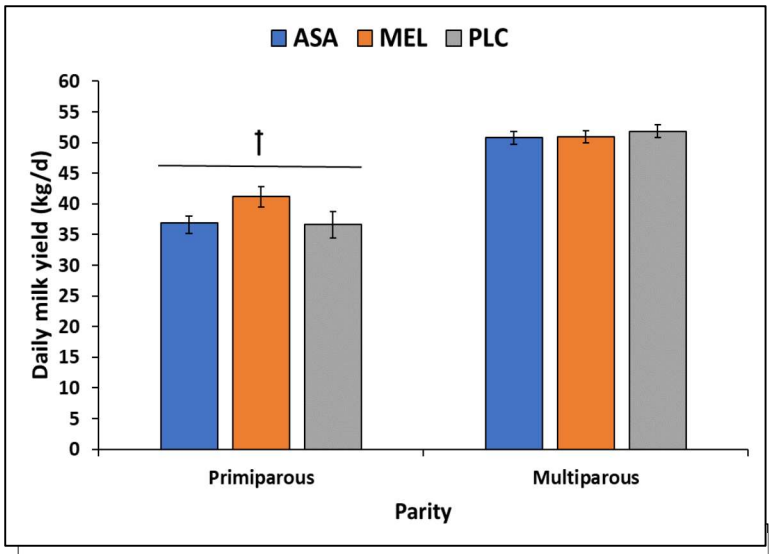

Figure 2. Average daily milk yield (kg/d) in the first 100 days after calving in primiparous and multiparous cows treated with either acetylsalicylic acid (ASA, n=81), Meloxicam (MEL, n=79) or Placebo (PLC, n=79) 14 days before the expected calving date.

We developed an anti-inflammatory treatment regimen with two common non-steroidal anti-inflammatory drugs (NSAIDs): aspirin and meloxicam. It is worth to mention that these two drugs are not approved to be used in dairy cattle, and producers must talk to their veterinarians before considering the use of these products in their herds. This treatment protocol included ***one single oral administration of aspirin (125 g/cow; 4-480 grain boluses) or one oral administration of meloxicam (1 mg/kg) at 14±3 days before the expected calving date***. This single dose approach is not only economical, but also easy to implement in dairy farms since it occurs in a common time for moving cows into a pre-fresh group, which often is used for restraining cows and perform other practices such as vaccination or placing activity monitors.

Here are some of the main preliminary results:

- First lactation cows treated with meloxicam tended to produce almost 10 pounds of milk per day more in the first 100 days in milk (around 1,000 pounds of milk more per treated cow; Figure 2).
- First lactation cows treated with either aspirin or meloxicam had around a 20 percentage points decrease on the incidence of stillbirth.
- All cows treated with aspirin had lower incidence of clinical metritis at 14 days in milk.

These results are encouraging and put some emphasis on the importance of having optimal pre-partum management of dairy cows in order to decrease inflammation and stress, especially in first lactation cows. As we keep uncovering more of the physiology of dairy cows during this challenging time, we will be able to target the farm management to ease these events and increase the odds of cows having optimal health and performance in the subsequent lactation.