Virginia Cooperative Extension
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Dairy Pipeline

School of Animal Sciences
Volume 45, No. 5 ● June 2024

Every Second Counts

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The little things we do during milking time have a profound effect on udder health and milk quality. It is important to remember that every quarter of every cow must be prepped for milking the same way by every milker at every milking. Specifics of milking procedures may vary from farm to farm. For example, one farm may prep cows in sets of four cows, while the next farm preps in sets of six. However, the basics of timing should ideally be the same or similar on every farm.

The first important time frame to remember relates to contact time of the teat disinfectant being used as pre-dip. Most pre-dips require a minimum of 30 seconds contact time to have adequate killing. However, there are a few dips marketed with a shorter kill time. If you are questioning the proper kill time for your pre-dip, check your manufacturer's instructions. During this time, the quarters can be stripped, but the dip needs to remain on the teat skin for the full time prior to wiping. In addition to contact time, we must ensure that the "prep-lag-time" has an average length of 90 seconds from start of tactile stimulation. Prep-lag-time is defined as the time from the start of stripping, massaging or wiping the teats with a towel (whichever comes first) to unit attachment. On some farms, first tactile stimulation is stripping, and on other farms it is wiping—it just depends on preparation procedures of the individual operation. If we attach units prior to the 60-second mark, we have not given adequate time for oxytocin to reach a useful concentration in the udder.

On the flip side, we need to ensure units are attached within 90 seconds of stimulation to make maximum use of the letdown effect. I encourage you to check the timing of your milking procedures with a stopwatch, then make necessary adjustments to the process until you are within these time frames. One suggested protocol would include prepping cows in blocks of four or five. Begin with the first cow by removing lose debris with a towel, then stripping each quarter and examine the milk for signs of clinical mastitis. This would be repeated for the remaining cows in that block. Start back at the first cow in the block (do not weave back through the cows in reverse order) and apply the pre-dip, ensuring that at least the bottom-half of the teat is entirely covered. Once the entire block has been pre-dipped, begin wiping the first cow of the block with a single-use towel. At this point, you should be able to also attach the unit before wiping the second cow of the block. However, check your timing and make sure a full 60 seconds have elapsed from the time that cow was stripped. If you are shy of the 60 second mark, continue wiping the remaining cows in the block and then return to attach the units, starting at the first cow.

Once you have a routine established, you will need to monitor the process monthly to ensure the time frames are being met. Proper milking procedures will help to lower somatic cell count, increase pounds in the tank and decrease milk-out time.

Does Milk Replacer Composition Impact Calf Gastrointestinal Health?

Authored by Shannon Chick, Ph.D. student with Dr. Katharine Knowlton, The Colonel Horace E. Alphin Professor of Dairy Science, School of Animal Sciences, Virginia Tech; knowlton@vt.edu

Calf management is a vital part of the dairy industry as raising good quality calves ensures that farmers will have good quality replacement heifers. Typical calf care includes feeding colostrum as soon as possible to give a jumpstart to the calf's immune system, but then the farmer must decide if they will be feeding the calf whole milk or milk replacer. While there are benefits to each choice, this article will focus on milk replacer. Milk replacer can have many different compositions depending on the source that a farmer chooses. Another important aspect of calf management is gastrointestinal health. Many calf health problems can arise from the gastrointestinal tract, so developing a healthy gastrointestinal tract is essential for healthy calves. This article explores some research on milk replacers with different compositions and how that impacts calf gastrointestinal health.

Milk replacer's ratio of omega 6 (n-6) and omega 3 (n-3) fatty acids is very different than the one found in whole milk. In some milk replacers the ratio is 35:1 while in whole milk the ratio is 5:1. These fatty acids are precursors of immune molecules that can cause an inflammatory response, which may cause problems for the calf's gastrointestinal tract. A group of researchers in the Netherlands investigated if changing the ratio of n-6 to n-3 would impact calf gastrointestinal health. Control calves were given milk replacer with a ratio of 40.6:1 n-6 to n-3, while experimental treatment had a ratio of 6.5:1, which is much closer to whole milk. These diets were fed twice daily for 25 days. Growth, fecal consistency, and gastrointestinal tract permeability in the preweaning dairy calves were investigated. The researchers found that decreasing the ratio of n-6 to n-3 may have increased tight junction function in the jejunum and ileum of the calves as the n-3 content found in those tissues was increased for the experimental group. However, gastrointestinal permeability was mainly unchanged. Growth and fecal consistency were unaffected by the treatment. It was concluded that more studies are needed to fully understand how dietary fats impact calf gastrointestinal health. While fatty acids are one part of the composition of milk replacer, there are other components that contribute to composition such as amino acid content.

A group of researchers at Purdue University investigated whether adding L-Glutamine (a commonly used amino acid supplement to improve gastrointestinal and immune function in calves) to milk replacer would improve health and well-being of calves in production conditions. The study focused on growth performance, disease, stress response, immune function, and gastrointestinal permeability in calves given milk replacer with L-Glutamine supplementation. Fifteen calves were given milk replacer with L-Glutamine supplementation, and 15 calves were given milk replacer without L-Glutamine

supplementation. These diets were fed until the calves were weaned. It was reported that calves supplemented with 1.0% L-Glutamine had improved biomarkers of gastrointestinal health, physiological stress, and immune function. However, growth performance, health scores, and postabsorptive metabolic biomarkers were unchanged. Some positive change was observed with supplementing L-Glutamine, but there is another way that composition can be altered that may provide more significant benefits. The source of components, like fat or protein, can change the composition of milk replacer.

Optimizing milk replacer composition is vital to feeding calves as farmers need to ensure that the animals are getting the correct nutrition for growth and development. Some propose increasing the fat content of milk replacer to be more in line with whole milk to improve the nutritional value of milk replacer, but the composition of the fats is an important factor to consider. Use of alternative sources for fat in milk replacer can cause problems as different fat sources have varying structures in comparison to whole milk fats. Another group of researchers from the Netherlands evaluated different fat compositions of milk replacer on gastrointestinal health and postprandial metabolism in dairy calves. The researchers hypothesized that milk replacer with a blend of animal-sourced fats (lard and dairy cream) would have digestion benefits compared to milk replacer with vegetable-sourced fats. Three fat compositions were tested: animal sources only, vegetable sources only, and a mixture of both. These diets were fed to calves for 35 days. The results showed that fat composition in milk replacer did not affect growth, milk replacer intake, total-tract digestibility, nor gastrointestinal permeability. However, it was reported that abomasal emptying was slower and postprandial triglyceride concentration was lower in calves fed milk replacer with only vegetable-sourced fat in comparison to calves fed milk replacer with only animal-sourced fat. There are changes observed with different milk replacer compositions, but it is difficult to say if there is a clear, consistent benefit.

In conclusion, there may be some benefits to different compositions of milk replacer, but more research is needed to solidify what composition works best for calf health and development. Gastrointestinal health is still a critical part of raising strong healthy calves, however different aspects of a calf management may show more impactful results in comparison to diets using different milk replacer compositions.

Upcoming Events

June 7, 2024
June Dairy Month Poster Contest Deadline

June TBA
Stop the Bleed – Farm First Aid (Youth + Adults)
Franklin County

June 15, 2024
Franklin County Livestock Show with Dairy Heifers and new Dairy Steer classes

June 26, 2024
FFA Milk Quality & Products CDE (Youth)

July TBA
Stop the Bleed – Farm First Aid (Youth + Adults)
Franklin County

July 8-11, 2024
Southeast Youth Dairy Retreat
Florida

July 12, 2024
VA Dairy Expo
Dayton, VA

August TBA
CPR & First Aid Class for Farmers
Franklin County

August 1, 2024
State 4-H / FFA Dairy Youth Field Day
Harrisonburg, VA

August 3, 2024
Virginia State Dairy Shows
Rockingham County Fairgrounds

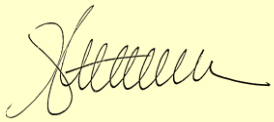
September 27, 2024
State Fair Junior Dairyman's Contest

September 27-29, 2024
VA State Fair Dairy Show

October 21, 2024
Hokie Cow Classic
Blacksburg County Club

If you are a person with a disability and require any auxiliary aids, services, or other accommodations for any Extension event, please discuss your accommodation needs with the Extension staff at your local Extension office at least 1 week prior to the event.

For more information on Dairy Extension or to learn more about our current programs, visit us at VTDairy—Home of the Dairy Extension Program online at www.sas.vt.edu/extension/vtdairy.html



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2024 DASC-168NP