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Calf Scours – Causes and Management

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Calf scours or diarrhea is a very costly problem for many producers. Calves that suffer from scours can become critically ill in a short period of time. The possible pathogens that are the causative agents of this disease are numerous. These infections lead to clinical signs such as diarrhea and dehydration, but the critical issues occurring on the calf's body, electrolyte depletion and acid-base imbalances, can be the underlying cause of the animal's demise. If the calf fails to receive the proper amount of colostrum, it will be more susceptible to the pathogens that cause neonatal diarrhea.

The type of agents that lead to an infection can often be related to the calf's age as well as the integrity of the calf's immune system. One of the most important bacterial causes of scours is *Escherichia coli* (*E. coli*). It typically affects very young calves less than a week old. By releasing a toxin in the intestine, *E. coli* leads to what is termed hypersecretory diarrhea. Signs include severe watery diarrhea that is generally yellow to white in color. Calves are normally nonfebrile and exhibit no blood, fibrin or mucus in their stool. Failure to promptly treat this disease may lead to certain secondary problems such as meningitis or polyarthritis.

There are primarily two viruses that can lead to diarrhea in young calves. One is a rotavirus. This virus is very prevalent across the U.S., and estimates are that 80 to 90 percent of adult cattle are seropositive for this virus. The rotavirus survives well in the environment, affects the small intestines and leads to a malabsorptive diarrhea. Most calves infected are from five to fourteen days of age. It leads to a milder disease that has a lower mortality rate. Affected calves may only show clinical signs of diarrhea for a few days. Another virus leading to neonatal diarrhea is a coronavirus. This virus also infects the small intestine and sometimes the proximal colon. It causes a more severe, prolonged disease than rotavirus. Most cases are seen in calves one to three weeks of age. Clinical signs include diarrhea and occasionally mucus or bloody discharge and increased straining if the colon becomes involved. Coronavirus leads to more intestinal damage and a longer recovery period that rotavirus.

A protozoan cause of neonatal scours is *Cryptosporidium*. It mainly affects calves one to three weeks of age and leads to a mild malabsorptive diarrhea. The calves usually exhibit good appetites but may show weight loss and emaciation if diarrhea continues for days to weeks. This disease has a low mortality rate and is primarily due to poor sanitation practices in the calf's environment or with calf equipment. *Cryptosporidia* can be zoonotic, meaning that people could also be infected; therefore, people who treat infected calves should be diligent about sanitation practices.

Coccidiosis is also a protozoal disease affecting calves three weeks of age and older. It usually involves young, stressed animals. Stress may be related to

overcrowding, sudden changes in feed or poor sanitation. These infections are usually self-limiting, and mortality rates are low. Symptoms include mild to severe bloody diarrhea, decreased appetite, lethargy and dehydration. Clinical diagnosis is made by finding significant numbers of parasites in a stool sample. Hygiene, dry conditions and isolation of infected animals are indicated for further prevention of coccidiosis.

Prevention is a key factor when dealing with calf scour issues on a farm. In order to decrease the incidence of disease in the herd, it is important to:

- Maximize colostrum transfer.
- Capitalize on environmental sanitation – clean boots; sanitize bottles, buckets and feeders; minimize traffic from adult to calf pens.
- Minimize stressors such as overcrowding or poor nutrition.
- Vaccinate dry cows for *E. coli*, rota, corona and *C. perfringens* 60 days before calving

Recommendations for diseased calves should focus on these key factors:

- Correcting dehydration is critical, and correcting the fluid deficit is the most important treatment for scours. The practice of skipping milk feedings and replacing them with water can be very detrimental. It is better to give regular feed-ings and add water/electrolyte supplementation in between to correct dehydration. If a calf is down and won't suckle, IV fluids are typically needed.
- Treat electrolyte imbalances by adding electrolyte powders to oral fluids.
- Provide nutritional support since young animals have little energy reserve.
- Administer a systemic broad spectrum antibiotic if a bacterial cause of scours is suspected, which can be beneficial to prevent septicemia.

In the case of coccidiosis, a sulfa-antibiotic (sulfaquinoxaline, sulfamethazine) or amprolium (Corrid) should be used because they are effective against these infections. It is important to consult with your local veterinarian, since he/she will know what diseases may be prevalent in your particular area.

For more information about calf scours and other dairy cattle management tips, contact your local county Extension office.

Is Milk Urea Nitrogen in Your Toolbox?

Dr. Shane Gadberry, Associate Professor

Since 2005 dairy producers across Arkansas have observed a change in feed ingredient availability and prices. A few observations include increased competition for corn grain and reduced corn feed use, increased availability and use of dried distillers grains and sometimes modified distillers grains and reduced availability of corn gluten feed pellets out of Memphis. Reductions in cotton acreage affected price and availability of whole cottonseed. Just when we think we have a new "norm," things change. This past year, the price of corn for feed energy was very competitive in comparison to the co-product feeds, and protein feedstuffs remained quite high (which a noneconomist may immediately conclude is the reason for the sustained price of some of the higher protein co-products). For the dairy nutritionist, milk urea nitrogen is one tool in the box that helps evaluate the lack of or excess of dietary protein. The following information was taken from **Interpreting Milk Urea Nitrogen (MUN) Values** at http://www.extension.org/pages/11322/interpreting-milk-urea-nitrogen-mun-values.

What is MUN?

Milk urea nitrogen is the fraction of milk protein that is derived from blood urea nitrogen (BUN).

What is the impact of a high MUN?

Your herd is possibly wasting feed protein along with excreting excess nitrogen into the environment. A MUN ≥ 15 mg/dl would be considered high.

What is the impact of a low MUN?

If MUN values are too low, the rumen bacteria yield can be reduced, thereby limiting milk production and milk protein yield. A MUN ≤ 8 mg/dl would be considered low.

What are target MUN values?

Every herd can have a different optimal MUN depending on the time of feeding relative to milking time, total mixed rations (TMR) compared to component-fed herds, cow eating patterns and other factors that affect BUN values. The power of a MUN test is to monitor changes in feeding and management programs within a herd.

1. Develop a MUN baseline that is "normal" for your herd (values may range from 8 to 16).
2. When the farm baseline changes by more than 2 to 3 points (normal variation), look for changes in your herd that caused this MUN shift.

3. Look at weekly averages, as large variations occur day to day.
4. DHI and milk plant MUN values will vary due to machine standards and sampling differences.

How do I address a high MUN?

High MUNs may be more likely when a diet is composed of many high protein co-product feeds and well-fertilized grass or legume-based pasture and hay. A few factors to consider would be total dietary protein and rumen degradable protein and rumen nondegradable protein balance in regard to the expected availability of the digestible organic matter of the diet. Type of grain and coarseness of processed grain can impact utilization of rumen ammonia by microbes.

How do I address a low MUN?

Some may consider a low MUN more alarming than a high MUN, but a low MUN may be rarer today when co-product feeds are being used for dietary energy balance. Low MUN is indicative of inadequate dietary protein. If protein balance appears adequate, evaluate protein sources for their potential bypass protein value. Some feedstuffs, such as distillers grains, are high in rumen nondegradable protein. Also, stored forages that were not harvested at ideal moisture conditions can undergo a heating process that results in protein becoming bound to fiber, which reduces protein availability.

For more information on MUN and other dairy management topics, visit the eXtension.org web site http://www.extension.org/pages/15603/dairy-cattle-nutrition-of-milking-and-dry-dairy-cows.

Forage Quality Affects Bottom Line

Dr. Dirk Philipp, Assistant Professor

Understanding the factors that affect forage quality is crucial for providing dairy cows with diets that meet their energy and nutrient requirements. Animal performance is the ultimate measure of forage quality, but there are concepts and values surrounding plant chemical composition that make it worthwhile to closely follow feed composition and analyses. In general, plant biomass consists of carbohydrates, fats and proteins. The makeup of these compounds and the ratios among them determine forage quality, which depends on plant species, maturity and environmental factors including soil fertility.

From a species perspective, we typically distinguish between warm- and cool-season forages. Bermudagrass and corn are well-known examples of warm-season grasses, while tall fescue, orchardgrass and ryegrass are cool-season grasses. Cool-season grasses typically have a higher forage quality than warm-season grasses caused by the tissue structure of their leaves. However, cool-season forages are limited in their growth by high summer temperatures in the southern U.S., while many productive warm-season forages may not survive the relatively cold winters in some areas there. For both types of forage grasses, the maturity stage is probably the most important factor influencing forage quality. The reason for this is the translocation of sugars within the plant to build structural carbohydrates and growth of reproductive plant shoots during the course of the growing season. Optimizing forage management is thus important for both hay-making and grazing.

The plant fraction that describes structural carbohydrates is called neutral detergent fiber (NDF). This fraction encompasses cellulose, hemicellulose and fiber-bound nitrogen. These materials are found in cell walls, and since these have a stability function for an aging shoot or plant, NDF is accumulated with increased maturity. Ruminants are able to digest the fiber fraction to a large extent. However, the correct ratio of fiber to non-fibrous carbohydrates and protein has to be maintained for optimal animal performance.

Apart from dry matter (DM) digestibility, which declines with increasing maturity, the ratio of leaf to stem DM also declines and can be used as an indicator of forage quality as well. This is because leaves are the main location for photosynthesis and production of sugars and proteins. There are differences between grassy plants and broadleaf plants such as alfalfa, which is a good example of why maintaining leaf material during the hay- or silage-making process will maintain a high degree of forage quality.

If the forage consumed by animals is mainly derived from pasturing, a fine-tuned grazing management is paramount for maintaining high forage quality and thus achieving high milk yields. Forage grasses can be kept, to a certain extent, within the vegetative phase using the right grazing methods. Other options include mixtures of grasses and legumes in the same pasture or in separate areas, as practiced in many parts of the world. Being botanically both broadleaf and cool-season plants, legumes have higher leaf-to-stem ratios than grass-like plants and thus cell structures that potentially lead to an improvement of pasture forage quality. Research has shown that grass-legume mixtures are higher in crude protein and overall digestibility, but managing multi-species pastures is

challenging, especially in the southern U.S., where weed and pest pressures are higher than in northern areas.

In a dairy operation, allocating forage to lactating animals, heifers, dry animals and calves, as examples, means making use of advanced grazing methods. These include creep grazing, first-last grazing, strip grazing or rotational stocking. The latter improves forage utilization and attempts to keep plants within the vegetative phase as long as possible. With improved stocking methods, negative effects of plant maturity can be avoided while taking advantage of the natural growth cycle of forage plants throughout the year.

Arkansas State 4-H Dairy Events Set for 2014

Steve Jones, Associate Professor

The 2014 Arkansas 4-H Dairy Camp and competitive activities will be held in conjunction with the 25th Annual 4-State Dairy Days, June 19-22, at the Benton County Fairgrounds. The activities include the annual Dairy Camp, Dairy Ambassador Interview/Presentations, Dairy Skillathon and Dairy Quiz Bowl.

The annual 4-H Dairy Camp will start at noon on June 19 and conclude at noon on June 20. This year's camp will focus on dairy cattle grooming and showmanship. Professional dairy fitters will be the guest instructors. Guest clinicians will guide you through the basics and finer points of dairy cattle grooming and showmanship. Youth will work in small groups and receive individual assistance from dairy professionals, county agents and volunteer leaders. In addition, there will be presentations by dairy industry professionals about career opportunities in the dairy industry. Youth should bring their show animals and grooming equipment. Lodging for camp participants (youth and adults) will be provided on Thursday at the Wingate by Wyndham Hotel. Meals, snacks and refreshments will be provided. Registration will be $35 per participant (youth and adults) with the registration deadline on June 2, 2014.

The Dairy Ambassador Presentation/Interview will be on Friday, June 20, at 1 p.m. The ambassador program criteria will consist of three (3) levels. The first level is promotion activities. Each participant must be actively involved in at least two (2) promotional activities to include submitting an entry in the 2014 county-sponsored dairy recipe contest. Each participant is expected to enter in their county Farm Bureau Dairy Foods Recipe Contest. If no contest is held in their county in 2014, participant is expected to enter a dairy recipe directly to the Arkansas Farm Bureau State Dairy Foods Recipe Contest. The second promotional activity will be chosen by the participant. The second activity will be judged on type of activity, number of people reached and creativity.

NOTE: The second promotional activity must be explained in the essay portion of the application, which does not have to be completed at time of entry but must be completed before the ambassador program contest in June. The second level of the ambassador program is the interview. Participants will be interviewed individually by a panel of judges. Participants should have knowledge of dairy production, the Arkansas dairy industry, the National Dairy Promotion Checkoff program, dairy cooperatives in Arkansas and other Arkansas dairy facts such as production and processing. The interview will consist of questions involving dairy management practices. Study references may include but are not limited to University of Arkansas Dairy publications and fact aheets, University of Arkansas 4-H project books, Holstein Foundation educational workbooks; web sites for reference include http://www.holsteinfoundation.org/education/workbooks.html; http://www.midwestdairy.com or http://www.nationaldairycouncil.org; http://www.aragriculture.org/dairy.html.

The third and final level of the ambassador program is the oral presentation. Participants will develop and present a speech. The speech should be from 3 to 5 minutes in length. Presentation may be an illustrated talk or prepared speech. NO audio/visual aids are permitted.

The Dairy Skillathon starts at 3 p.m. on Friday. Competition will be divided into two age divisions: junior (9-13) and senior (14-19). Each division (junior and senior) will consist of a system of questions relative to the dairy project. Curriculum materials and contact information is listed below. Each contestant will be given a scorecard which must be presented to Skillathon officials to compete. It is the responsibility of the contestant to keep up with his or her scorecard. Competition will consist of five stations with 25 points per station. Contest will be a 100-point contest (4 stations × 25 potential points = 100). Station 5 is a timed tiebreaker station. Scores at this station will be used only in the event of a tie in total scores of Stations 1-4. The first tiebreaker consideration is the contestant's SCORE at Station 5. The second tiebreaker consideration is the contestant's TIME at Station 5. The contestant will have a maximum of 3 minutes to complete each station.

The Dairy Quiz Bowl will begin at 6 p.m. The Dairy Quiz Bowl is a tournament-style contest made up of teams of three to four 4-H members. There is a junior (9-13) and senior (14-19) division. Question topics will cover animal health, nutrition, reproduction, marketing, milk and more.

The Dairy Judging contest will be conducted on Saturday, June 21, at 9 a.m. Age is determined by age as of January 1 of the current year. There will be both a junior (9-13) and senior (14-19) age division. This is considered the Arkansas State 4-H Contest.

Other 4-States Dairy Days activities include 1) Dairy Olympics, 2) Select Dairy Heifer Sale, 3) Senior Fitting Contest, 4) Showmanship Contests and 5) All Breeds Show. For details of all activities, go to the 4-States Dairy Days web site at http://www.4statedairydays.org.