

Calf Health Basics



Jillian Bohlen, Associate Professor, Department of Animal and Dairy Science
Emmanuel Rollin, Clinical Associate Professor, College of Veterinary Medicine

A core philosophy for protecting calf health

Calf health is a key variable for calf growth and performance. Whether the end goal for the calf is meat or milk, and whether you talk in terms of feed to gain or first lactation performance, calf health can and will impact your bottom line. Producers should not expect to know all calf health issues, their causes, and the most successful treatments. Instead, a producer's main goal should be to accurately identify and differentiate normal from abnormal in a calf's physical state and behavior. The topics discussed in this publication should increase producers' awareness of key areas of observation while helping producers to identify normal and abnormal health parameters in calves. The more comfortable and knowledgeable a producer is in these areas, the more likely a calf is to receive timely and accurate treatment, ultimately improving its chances of a quick recovery. In addition, this information can be used to develop calf management protocols and treatment strategies.



UNIVERSITY OF GEORGIA
EXTENSION

Getting started

Establish a Relationship With a Veterinarian

When planning and thinking about calf health in the herd, it is essential to develop protocols that will reduce cases of illness, allow for quick identification and treatment of illnesses, and ultimately reduce calf loss. In developing these protocols, it is essential to form a relationship with a veterinarian. Not only are veterinarians aware of signs of illness, they can also help you to identify the most appropriate forms of treatment. In addition, they are acutely aware of health issues that have a higher prevalence in the area and will work to develop protocols that more specifically target prevention of those illnesses.

General Items to Have on Hand for Calves

Every producer should have a few general items on hand at all times to help remedy issues with calf health. These can all be easily found at the local farm supply store and should be readily accessible to help treat or sustain a calf in the case that a veterinarian is needed.

- An electronic thermometer can accurately and quickly assess a calf's body temperature.
- A stethoscope is necessary for listening to heart rates and lung sounds.
- Oral electrolytes will help bolster calves that are having issues with dehydration.
- Probiotics will help restore gut microbes and health.
- Nutrient-packed drenches restore important nutrients for general calf vitality in a calf that may be losing excessive nutrients or has backed off feed.
- Supplemental B vitamins help support appetite, metabolism, and efficient energy production.

Using any of these products poses little to no risk when calf health is in question. In addition to the items listed above, producers should have treatment protocols on hand for common calf ailments, e.g., scours, respiratory issues. When considering these protocols, any drugs necessary to treat ailments should be readily available either on the farm in or in the form of a veterinary prescription that may be filled quickly.

Outside Influences

When beginning to observe calves, it's important to recognize that there are a number of reasons that calf observations or vital signs may appear abnormal but are unrelated to the calf's health. These include:

- Recent pen changes or group movements
- Overcrowding
- Feed changes
- General environmental changes
 - Elevated temperatures or excessive humidity
 - Wet and muddy conditions
 - Little to no access to shade
- Handling
 - Movement
 - Management activities
 - Tagging, tattooing, dehorning, vaccinating, etc.

In most cases, many animals that undergo change will appear abnormal. The level of change often determines how long it will take for parameters to return to normal. It is best to return for observations when the majority of the calves appear normal again.

General observations

Behavior

Although it's often overlooked, simply observing calf behavior is a pertinent practice for identifying calf health issues early. Changes in behavior are frequently the first observation made to warrant further investigation of physical characteristics. Assessing behavioral changes is best and most accurately done when animals are frequently observed as part of management. There are a few general, behavioral characteristics that most calves adhere to. Normal, healthy calves are bright and alert while being responsive to sudden changes and movements. Calves also have different behaviors based on their daily routines, such as higher activity when they expect feed and lower activity after a meal. A few abnormal characteristics of calf behavior may include:

- Dull and listless with slowed or staggered responses to stimulus
- Lack of appetite
 - If bottle-fed, this may include a reduction in drinking speed
- Exercise intolerance (lags behind when moving a group)
- Teeth grinding
- General appearance that includes dull eyes, dropped head, lowered ears, and/or tucked tail

Cattle are generally good at hiding the early symptoms of disease, so careful observation by someone with experience with healthy and sick calves is necessary to identify calves that require further attention. Calves may also change their behavior if they know that they are being watched.

Physical Characteristics

In general, there are several other locations on the calf's body that can be looked over for abnormalities. Overall, the calf's extremities should be warm. If cold to the touch, the calf may have reduced circulation to the extremities, which would be considered abnormal. Beyond the extremities, one should also observe the joints, umbilicus, and eyes. Infections in younger calves often localize in the joints and/or umbilical area, which is often the result of an infection soon after birth that gained entry to the circulatory system via the umbilical cord. Excessive heating and swelling as the result of inflammation often indicates an infection settling in these locations. Swelling and thickening at the umbilicus may be accompanied by pus discharge. Moving to the eyes, normal sclera (the white, outer layer of the eye) should appear white with small, fine blood vessels. Abnormal sclera may be bloodshot, have a consistent pink color throughout, or be thickened and red. Please note that ruptured blood vessels are not uncommon in newly born calves that are the result of a more difficult birth than normal.

Closer examination

Basic Vital Statistics

Although not a very sensitive measurement, body condition tells us about the nutritional history of the animal. In general, young beef and dairy calves tend to be the thinnest animals on farm, even when they're healthy.

For this reason, assessing body condition can prove difficult. Noticeable underconditioning occurs when backbones are easily visible, short ribs are distinct, and there is significant hollowing between the hook, thurl, and pin bones. Animals that are this thin have less energy reserves to stay warm and fight off disease.

The basic vital statistics for calves are outlined in Table 1. Body temperatures should be taken rectally, preferably with an electronic thermometer, as they are much faster and safer than the older mercury thermometers. The respiration rate rises with body temperature in the body's attempt to cool itself, and measuring respiration rate is done by simple observation. A producer should step back and watch the rise and fall of the body cavity to assess respiration. Placing a hand in front of the nose or mouth of the animal to measure respiration is not advised as the smells and/or intrigue will likely alter the animal's true breathing pattern. Abnormalities in respiration are often noticed by comparing breathing patterns with other calves housed in the same area. A stethoscope can also be used to assess respiratory sounds and listen for abnormal lung sounds such as crackles or wheezes.

Heart (pulse) rates are typically twice that of an adult cow and irregular heart rates can indicate illness. To clarify, a heart rate measures how many times the heart beats per minute while a pulse rate measures the pulse pressure (equivalent to a heart beat) in an artery through the number of pulses per minute. For this reason, pulse rate can be taken by placing two fingers over an artery. Easily accessible arteries are located at the base of the tail and under the jaw. In severely ill calves, pulse rates may be difficult to assess and listening to the heart becomes the most accurate method for determining the number of beats/minute of the heart. Heart rate is assessed by listening to the rate and rhythm of the heart with a stethoscope. The stethoscope should be placed behind the left elbow of the calf and against the chest wall. Some movement may be required to improve how easily the heart can be heard beating. It is important to realize that environment as well as activity level may change these parameters. Care should be taken that calves are not moved immediately prior to assessment and that elevated ambient temperature is accounted for when measuring and determining abnormal levels. Most calves are healthiest and grow best when ambient air temperatures are within the range of 55-78 degrees Fahrenheit. Temperatures above 78 °F, especially when coupled with increasing humidity levels, will begin to impact calf health parameters and vital statistics. For example, a calf's temperature when experiencing heat stress (temperatures above 78 °F) can range from 102-108 °F, with temperatures of 108 °F and above triggering mortality. During these times of elevated body temperature, heart rate and respiration rate will increase as the body attempts to cool.

Table 1. Normal Vital Statistics for Calves.

Vital sign	Normal
Temperature	100.0–102.5 °F
Heart (pulse) rate	100–140 beats per minute
Respiratory rate	30–60 breaths per minute

Fecal Consistency and Color

What is classified as “normal” fecal consistency and color can change according to what an animal is eating. Alterations in diet may change one or both of these parameters, thus other abnormalities should be identified prior to classifying a calf as sick. Typically, normal fecal consistency is brown to dark brown with a semi-solid consistency. As solids intake increases in calves, the fecal consistency will likely appear firmer. Again, various feed components and nutrient levels may alter this consistency and ultimately the color. It is not uncommon for fecal characteristics to change drastically over the first week of life, as the calf's gastrointestinal tract is being colonized by microorganisms. Producers should take note of changes that occur when no changes in diet have happened and/or the calf shows other signs of illness.

There are many potential off-colors as a result of pathogen type and/or digestive disturbances. Some of the common abnormal color descriptors are: mustard, bloody, butterscotch, white, or gray. If these colors are detected with other signs of illness, treatment should be pursued. Blood in the manure signals that the integrity

of the gut mucosa has been compromised and should not be ignored. If there are digestive disturbances associated with particular pathogens or dietary changes, fecal material will often loosen in consistency (become more watery). This occurs as a result of excess water secretion into the feces, commonly referred to as “scours.”

A simple guide to observing calves to determine the severity of illness was developed by The Pennsylvania State University and may be found in Figure 1 below. In this system, a score of 1 is a normal observation, while a score of 5 represents a severe problem.

Calf Observation Scoring System

Scores from 1 (normal) to 5 (severe problem)

General appearance	
Score	Observation
1	Normal: alert, bright eyes, ears up
2	Slightly off: droopy ears
3	Moderately depressed: head and ears droop, eyes dull or sunken, lethargic
4	Moderately severe depression: head and ears droop, eyes dull or sunken, will not rise
5	Severe depression: flat on side

Scours	
Score	Observation
1	Normal (firm to soft) consistency; brown to light brown color; normal odor
2	Soft to loose consistency; yellow, brown, or green color; mucus; slight odor
3	Loose to watery consistency; yellow or green color; mucus; strong odor
4	Watery consistency; yellow, green, or clear color; mucus; slight blood; strong odor
5	Watery consistency; clear color; mucus; bloody

Respiratory	
Score	Observation
1	Normal (no cough, slow breathing)
2	Slight cough; runny nose; watery eyes; slow, normal breathing
3	Moderate cough; runny nose; watery eyes, rapid breathing
4	Moderately severe, very frequent cough; mucus discharge from nose; watery eyes; rapid panting
5	Severe, chronic cough; irregular, weak to rapid breathing; eyes rolling; mucus discharge from nose

Figure 1. The CalfTrack™ Scoring System Developed by Penn State for Evaluating Calf Health.

Additional assistance for calf health assessments may be found in the University of Wisconsin-Madison School of Veterinary Medicine calf health scoring guide in Figure 2. This secondary guide includes visuals to assist in determining appropriate scores, with a score of 0 indicating normal calf observations and a score of 3 indicating a severely ill calf.












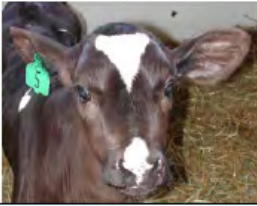






Calf Health Scoring Criteria				
Clinical parameter	0	1	2	3
Rectal temperature	100–100.9 °F	101–101.9 °F	102–102.9 °F	≥ 103 °F
Cough	No cough	Induce single cough	Induced repeated coughs or occasional spontaneous cough	Repeated spontaneous coughs
Nasal discharge	Normal, serous discharge 	Small amount of unilateral cloudy discharge 	Bilateral, cloudy or excessive mucus discharge 	Copious, bilateral mucopurulent nasal discharge 
Eye scores	Normal 	Small amount of ocular discharge 	Moderate amount of bilateral discharge 	Heavy ocular discharge 
Ear scores	Normal 	Ear flick or head shake 	Slight unilateral droop 	Head tilt or bilateral droop 
Fecal scores	Normal 	Semi-formed, pasty 	Loose, but stays on top of bedding 	Watery, sifts through bedding 

Figure 2. Calf Health Scoring Guide Created by the University of Wisconsin-Madison School of Veterinary Medicine.

Hydration

Healthy animals are well-hydrated animals. A scouring animal can lose up to 10% of their body weight in a single day. Most often, a calf suffering from a gut-disrupting pathogen dies from dehydration not the organism itself. Hydration status of an animal can be determined by a skin pinch test. To do this, pinch the loose skin on the neck of the calf between your thumb and forefinger, pull away from the animal's body, and then release. In a normal reaction, the skin will retract immediately (less than half a second). In an abnormal reaction, the skin remains pinched or "tented" away from the body. The amount of time it takes the skin to retract is a direct indicator of the level of hydration. The longer the pinched skin remains tented, the more dehydrated the animal is. According to basic associations, skin taking two to six seconds to retract indicates a moderate dehydration level of 8%, and skin taking over six seconds to retract indicates approximately 10% dehydration, which is classified as severe dehydration.

A calf's eye sockets may also prove a valuable resource for assessing hydration level. If a calf's eye fills the eye socket, hydration is considered normal. Because there is a fat pad behind the eye that shrinks when the calf is dehydrated, abnormal hydration levels are apparent by a reduced or sunken appearance of the eye within the eye socket. This may be visible by simply observing the eye or by pulling the lower lid down from the eye.

Mucous Membranes

Mucous membranes, tissues that secrete mucus and line many body cavities and organs, are another point of change in sick calves. For assessment in calves, the mouth and nose are used. Normal mucous membranes at these two locations are moist and warm to the touch. When pressure is applied to the gum line in the mouth with a finger and then removed, the gum color should change from white to pink. In a healthy calf, this should take no longer than two seconds. In sick calves, the mouth and nose are often dry and cold to the touch. In addition, the color change from white to pink takes over two seconds, which may signal poor blood circulation.

Final thoughts

Early recognition of declining calf health is essential to quick and accurate treatment as well as the likelihood of calf recovery. The basic parameters outlined in this document are not all-inclusive but should provide a foundation for the identification of calf health issues. The first steps on the path to accurately assessing the status of calf health are frequent observation and knowing what "normal" looks like. For more information about calf health or for help locating a large animal veterinarian servicing the area, contact your local Cooperative Extension agent. Calf protocols and treatments should be developed through an established relationship with a veterinarian.

The permalink for this UGA Extension publication is extension.uga.edu/publications/detail.html?number=B1500