

# CALF MANAGEMENT: DETECTING CALF DISEASE EARLY

## Getting all your calves off to a healthy start!



**VEAL**   
Farmers  
of Ontario



## Introduction

The first few weeks of the calf's life, from birth to weaning, are critical for health. During this time, calves are highly susceptible to infectious disease as their immune systems are not fully developed. This means they must rely on the antibodies they absorb from their first feedings of maternal colostrum or colostrum replacer. The consumption of a sufficient quantity of high quality, clean colostrum, and therefore antibodies after birth is required to protect them against infectious disease. Sick calves have a significant loss in production, showing reduced growth, poor reproductive performance, and lower milk production as growing and mature animals. Early disease detection improves overall herd health because infected cattle will be treated sooner, which improves cure rates and minimizes disease spread.

## Factors that predispose calves to disease

Although all young calves should be observed closely and regularly (at least twice daily) for signs of illness, some calves have a higher risk of contracting disease and should, therefore, be given additional attention. Factors that increase disease risk in calves include prolonged close contact between the cow and the newborn calf, exposure of the calf to manure or contaminated bedding from older cattle, drafty or cold housing conditions, inadequate nutrition, and exposure to other sick calves. Another major factor that increases the risk of calves becoming sick in the first few weeks of



life is the failure of passive transfer (FPT). This means that the calf has not received or has not absorbed an adequate amount of antibodies from the dam's colostrum or colostrum replacer. Without antibodies, the calf lacks sufficient immune protection to fight disease-causing pathogens that it may face in its environment. FPT can result when not enough colostrum is offered or fed, when it cannot be consumed, when the calf's intestinal tract cannot absorb well, when the dam's colostrum lacks antibodies, or when the colostrum becomes contaminated via poor collection techniques.



**Note:** Each calf needs to receive 150 to 200 g of antibodies (immunoglobulins or IgG) from either high quality maternal colostrum or colostrum replacer as soon as possible (within one to two hours of birth) in order for 90 per cent of calves to have successful passive transfer of immunity. In comparison, if only 100 g of IgG is fed, you can expect 50 per cent of calves to have insufficient immunity.

100 g = two litres of maternal colostrum

150 g = three litres of maternal colostrum

200 g = four litres of maternal colostrum

If using a colostrum replacer, be sure to examine the quantity of IgG per package. You may need to consider offering more than one package to ensure successful passive transfer.

Above note adapted from Dr. Sandra Godden, University of Minnesota.

## Why is colostrum important for preventing disease?

Colostrum is the "first milk" from the milking immediately after a cow has calved. It is rich in nutrients and provides antibodies which help the calf's immune system develop. It should be collected as soon as possible after calving and fed within 30 minutes of birth, or by six hours at the latest. Approximately eight to 37 per cent of neonatal calves in Ontario do not receive sufficient immunity because of FPT, which may be because of poor colostrum management<sup>1</sup>.

When feeding the newborn calf colostrum, it is important to remember these four things: **Cleanliness, Quality, Quantity and Quickness**.

<sup>1</sup> Trotz-Williams et al., 2008, Windeyer et al., 2014

### Cleanliness

- Wear milking gloves to clean udders and collect colostrum.
- Use standard udder prep and clean milking practices before collecting colostrum.
- Clean and sanitize milking equipment and all feeding utensils before use.

### Quality

Colostrum should be slightly yellow in colour; it should look like and have the consistency of melted vanilla ice cream. However, looking at the colour of colostrum should not be your only test for quality.

- Test colostrum quality using a colostrometer or refractometer. You should check the quality of colostrum before feeding, heat-treating, or freezing it.
  - 50 mg per mL IgG or more in colostrum is considered good quality. On a refractometer, a reading of 22 per cent corresponds to 50 mg per mL IgG.
- Do not feed pooled colostrum.
- Do not feed colostrum that is runny or thin, contains blood, or comes from cows with mastitis or that were treated with antibiotics.
- The best practice is to thaw frozen colostrum in a warm water bath of 50°C. This process will take approximately one hour, so it is best to begin thawing when the calf is born.
  - Colostrum can also be thawed on low power in the microwave with minimal damage to IgG content. Microwave the colostrum for short periods on low power. Pour off thawed colostrum and mix often during heating to avoid “hot spots”.
- Select cows for colostrum donation. Older cows may have higher quality colostrum than first calvers. Choose cows that are known to be disease-free. For example, cows should be Johne’s test negative, Leukosis negative, have



low somatic cell counts historically, and a negative California Mastitis Test (CMT) post-calving.

- Where colostrum quality is expected to be poor, offer more feedings of colostrum to calves. For example, colostrum quality can be negatively affected by high ambient temperature, large volumes produced at first milking (more than 8.5 kg), short (less than 21 days) or no dry period, and how colostrum is stored.
- Vaccination of the dam three to six weeks before calving is effective in increasing the concentration of specific colostral antibodies compared to unvaccinated dams and may result in an increase in passive transfer.

### Note:

Colostrum can be heat-treated before it is fed to the calf to kill bacteria, thereby reducing the risk of disease and improving overall absorption of the colostral antibodies. To kill bacteria without affecting quality, you should heat the colostrum to 56 to 60°C for 60 minutes. This is a lower temperature than pasteurization, which may be done for milk.

### Quantity

- Calves should be fed 10 per cent of their body weight in colostrum. For large breeds such as Holstein and Brown Swiss, offer four litres of colostrum within six hours of birth, while for smaller breeds like Jersey, Guernsey, Ayrshire, three litres of colostrum should be fed.
- Offer a second feeding of colostrum sooner (within four to six hours) when calves drink only two litres.
- Feeding transition milk for three days will benefit calves as it is very rich in nutrients and energy.

### Quickness

- Be patient but persistent in encouraging calves to drink as soon as possible after birth.
- If the calf will not drink, you should tube feed it colostrum within six hours of birth. If you are unsure about how to tube feed a calf, consult your herd veterinarian. Avoid tube feeding a calf more than three times per day.

For more information on proper colostrum feeding and management, please refer to Veal Farmers of Ontario’s “Colostrum Management” booklet and [www.calfcare.ca](http://www.calfcare.ca).

## Indicators of calf health or sickness

Knowing what a normal, healthy calf looks like makes it easier to identify changes that may occur in calves that are getting sick.

Changes to watch for that will identify calves that are sick include:

**Manure** - Changes in the colour, consistency, quantity, or smell of manure.

**Calf's posture and demeanour** - The calf appears depressed, lethargic, or indifferent, twitches, or has trouble holding its head up. The calf has front legs outstretched, has abnormal leg positioning, swollen joints, lameness, difficulty rising, cannot sit up, or does not get up when stimulated.

**Eyes** - The eyes appear dull, sunken, have a discharge in the corners, or evidence of discharge on the face below the eyes.

**Coat condition** - The hair coat appears to be dull, matted or damp, hair is long and shaggy, or the hair stands up along the back.

**Ears** - The ears may hang down, be droopy, or are cold to the touch.

**Nose** - The nose is dry, cracked or crusty, has a purulent discharge, or contains excess mucous.



**Navel** - The navel is swollen, hot, hard, or painful (calf kicks at the navel or struggles when the navel is touched).



**Breathing** - A calm, healthy calf under one month of age will take 24 to 36 breaths per minute. A calf older than one month of age but less than one year of age will take 15 to 30 breaths per minute. To assess breathing, watch the rise and fall of the calf's ribs for 15 seconds, then multiply the number of breaths by four. Be sure to count respirations before disturbing the calf. If a calf's breathing is shallow, laboured, rapid, uneven, or if the calf is coughing, grunting, or whistling while it breathes, this may indicate illness.

**Rectal temperature** - Normal rectal temperature for a calf is 38.6 to 39.4°C. Newborn calves have slightly higher normal temperatures between 38.5 to 40.5°C. Temperatures above or below the normal range may indicate illness. Hypothermia occurs when the calf's temperature is less than 37.8°C. Acute infections are characterized by a temperature above 40.5°C. Temperatures greater than 39.4°C in older calves are considered high and should be monitored.

**Appetite** - Unfinished meals, poor suckle response and slower drinking speed are indicators of poor or decreased appetite. If your calves are group housed, check data from the automatic feeder or observe calves at milk delivery to ensure all calves are going to the feeder and drinking for the same amount of time.

**Growth** - Poor gain in height or weight.

**Response to stimuli** - The calf has no response or is slow to respond to feeding time or the presence of a person.

**Heart rate** - An increased or decreased heart rate compared to normal resting may indicate fever. Measure heart rate by placing a stethoscope on the calf's ribcage just below the point of the carpal joint (knee) or by placing two fingers on the artery under the jaw or tail for 15 seconds, and then multiply the number of pulses by four to get beats per minute. Heart rates should be regular and rhythmic. A calf less than one month old has a heart rate of 100 to 130 beats per minute. A calf older than one month and less than one year will have a heart rate of 80 to 110 beats per minute.

Any other physical or behavioural differences in calves should be noted, including injuries. Often, early indicators of disease are a change from a healthy calf's normal behaviour or appearance. Recognizing these indicators requires you to know what is normal for each calf in your herd. Frequent, careful observation of calves and recognizing changes in behaviour and appearance can help detect early signs of disease, allowing for better treatment, a decrease in disease spread, and a reduced loss in production. There are some iPad apps that can help you track calf health, such as "Calf Health Scorer" - see the *Calf Care Corner* article "Tracking Health Scores" for more information.



## Causes of infectious disease in calves

Many different bacterial, protozoal or viral pathogens can cause disease in young calves. Pathogens mainly originate from other calves or cows and opportunistically infect susceptible calves. Many of the common disease-causing pathogens in calves can cause similar clinical signs which can make treatment difficult.

Disease is widespread in young calves. For example, in a study of 2874 heifer calves from 19 commercial dairy farms in Minnesota and Ontario, over 23 per cent of calves needed treatment for scours/diarrhea and 22 per cent needed treatment for bovine respiratory disease (BRD) at least once in the first three months of life.<sup>2</sup> Treatments and supportive therapy are most effective if you have diagnosed the

specific cause of sickness in your herd. Your herd veterinarian can assist you in determining why calves are sick with the help of diagnostic tools, and provide guidance on how to treat and prevent reoccurrence.

Calves may be at increased risk of infectious disease due to housing and management conditions, such as feeding waste milk from cows that were treated with antibiotics or that have mastitis, or the introduction of a sick animal into the herd. When you are adding a calf to a group or mixing groups, ensure all calves are healthy and there is adequate space allowance.

Introducing a sick animal into a group can make all animals in the group sick. This is especially important for veal producers who purchase and mix calves from multiple sources. These calves often have an unknown health background and will already be stressed due to transport and disruption of their feeding schedule. Stressed calves are more susceptible to disease.

Ensure you assess the health of all calves as they arrive on farm and prior to placing them in groups. Having an "all in-all out" stocking system increases biosecurity and reduces disease transmission compared to a continuous flow system. For more information on biosecurity, see Veal Farmers of Ontario's "Movement and isolation checklist" poster and Ontario Livestock & Poultry Council's "Livestock On-Farm Biosecurity Information Guide".

**Note:** A pathogen is a microorganism such as bacteria, viruses, or protozoans that can infect calves and cause disease.

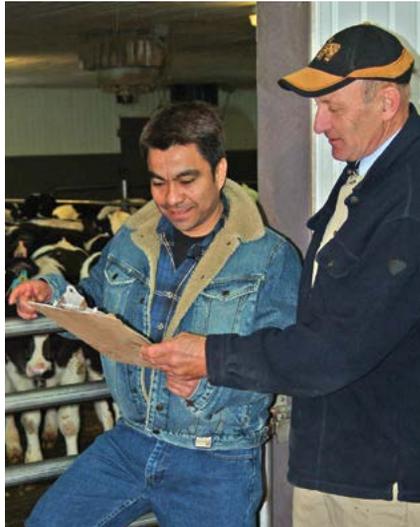


## Importance of working with your herd veterinarian

A valid Veterinary-Client-Patient-Relationship (VCPR) is essential for the development of herd health programs. These programs include pre-established protocols for the recognition and treatment of common health challenges, and training to help producers and stock people investigate and treat animals affected by larger health issues such as organisms resistant to multiple strains of antibiotics.

Many infectious diarrheal and respiratory disease risks for calves are dramatically reduced by 42 days of age. However, some pathogens like *Salmonella* and *Mannheimia haemolytica* can cause problems during all stages of production. Often these infections are difficult to control, with poor responses to commonly used antibiotics. If treatment of any disease is not effective or there is an outbreak (more than 10 per cent of the group and/or herd is impacted), you should consult with your veterinarian as soon as possible. Your veterinarian can conduct laboratory testing and post mortems to pinpoint the cause of the disease problem. Proper diagnosis and pathogen identification can lead to earlier diagnosis, improved treatment plans, and assist you in preventing future occurrences.

Developing a complete herd health plan that includes a vaccination program for dry cows as well as vaccinations for growing animals, and good neonatal management practices will be invaluable for addressing health challenges and preventing disease in your cattle. Veal farmers are encouraged to discuss the herd health plan in place at source farms.



## Conclusion

Through astute and careful observation of calves, and the identification of changes in manure, posture, coat condition, eyes, ears, nose, navel, breathing rates, body temperature, eating behaviour, growth, response to stimuli, and other changes in behaviour or appearance, it is possible to detect early signs of disease. Detecting early signs of disease means sick calves are found and treated sooner, improving treatment outcomes and reducing the risk of future disease problems. Early detection and treatment results in less severe disease in affected animals and more effective control of the spread of the disease as pathogen shedding is reduced.

Early detection of sick calves, accurate diagnosis, and timely treatment will prevent future disease outbreaks – saving you time and expense while ensuring calves grow to their full production potential.





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# CALF CARE CORNER

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