

Preventing Cryptosporidiosis, Commonly Called Crypto, in Dairy Calves



College of Agriculture,
Food and Environment
Cooperative Extension Service

By Donna M. Amaral-Phillips

Prevention of illness in young dairy calves has a positive impact on their growth, future production, and survivability. Diarrhea, commonly referred to as scours, is one disease complex that farmers often site as their main illness in young dairy calves. This diarrhea can be caused by a bacterium (i.e. *E.coli*), viruses (i.e. Rota and Corona Virus), protozoan parasites (i.e. coccidia and cryptosporidium), or a combination of these organisms. Vaccination of either the dam or the newborn calf have been used to successfully protect calves from many bacterial and viral causes of diarrhea. Coccidiosis, usually seen in recently weaned calves, can be controlled through the use of feed additives (Decox, Rumensin, Bovatec). However, control measures for cryptosporosis, commonly referred to as Crypto, are not as robust, as no vaccines, treatments, or feed additives exist for help in controlling this most common cause of diarrhea. By increasing one's understanding of this disease, one can minimize the effects of this organism on the health and future production of dairy calves.



What Causes Crypto?

Cryptosporidiosis is caused by the protozoan parasite, *Cryptosporidium*, and not a bacteria or virus. Forty different species of this particular protozoa have been named with 4 of these species known to infect cattle. The most common of these species being *C. parvum*, which also can cause this disease in humans. This protozoan is commonly isolated in calves within the first 3 weeks of life, most commonly at 9 to 14 days of age. Studies have shown a high percentage of calves become infected on all dairy farms. Although less common, it can be isolated in calves over 6 weeks of age which may be asymptomatic and infecting others around them. By itself, it is usually not fatal, but causes more severe illness in calves when accompanied by other viral and/or bacterial organisms causing diarrhea.

Crypto is contracted through the consumption of the parasite through fecal contaminated feed, water, environment, or on caretaker clothing or shoes/boots. Once ingested, this protozoan parasite causes damage to the cells in the small intestine resulting in diarrhea in the young calf. The protozoa invade the cells lining the small intestine, completes parts of its lifecycle, and then is released as an oocyst to either infect other cells in the intestine or is excreted via the feces into the calf's environment where the oocysts can infect other calves. Diagnosis of Crypto is made through detection of the oocysts in fecal material when examined under a microscope using special staining techniques or by other laboratory tests, such as ELISA or PCR.

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Once excreted in the feces, the oocysts are able to immediately infect other calves or humans. Shedding of the oocysts occurs 4 to 12 days after infection and may or may not be accompanied by diarrhea in the host calf. Infected calves can shed 10,000,000,000 oocysts daily over a period of 3 to 12 days. Very low doses of the infective oocyte are needed to cause disease. One study showed that as little as 17 oocysts are needed to cause disease. Both of these factors make Crypto a hard disease to control on-farm.

Symptoms of Crypto

Cryptosporidium can infect cattle of all ages, but the resulting diarrhea is mainly seen in young, preweaned calves. The prevalence is highest in calves 7 to 21 days of age. Calves infected can be asymptomatic or have severe diarrhea and become dehydrated. Feces are yellow or pale, watery, and contain mucus. The onset of diarrhea is generally 3 to 4 days after ingesting the Crypto oocysts and lasts for 1 to 2 weeks, a few days longer than diarrhea caused by *E.coli*, rotavirus, or coronavirus infections. Number of infective oocysts ingested is associated with the severity of the disease. Withholding milk and feeding only electrolytes may increase case fatalities as energy is needed for a robust immune response to fight the infection.

Infection persists until the host immune system eliminates the parasite. Calves should receive supportive therapy in the form of electrolyte solutions to replace lost fluids and electrolytes due to the diarrhea along with milk to provide energy. No “drug” treatments have been shown to be effective. No vaccines or feed additives are available for prevention.

Control Measures Decrease Exposure

Crypto is contracted through the consumption of infectious oocysts excreted in feces. At temperatures under 59°F, oocysts can remain infectious for as long as 1 year. To reduce the infectious load or number of oocysts ingested, biosecurity management practices are important. Strict hygiene is needed when feeding and caring for calves and in cleaning of housing between batches of calves. More cases are usually seen with an increase in environmental temperature and humidity.

Following strict hygiene practices can decrease the environmental challenge to calves. Controlling rodent and fly populations can help decrease the potential spread of this disease, especially when controlling the contamination of feed. Feed should be stored to prevent animals (i.e. barn cats) from defecating in feed, a good management practice irrespective if they can spread Crypto to calves. Washing “milk-feeding” equipment at each feeding with hot water and soap and allowing it to completely dry should be practiced. When calf starter becomes contaminated with fecal material, starter should be replaced and the pail or feeding trough cleaned before adding fresh feed. Scouring calves should be fed last and footwear washed before and after taking care of calves. Hand washing is critical for not only preventing the spread of disease in calves, but also to prevent the disease in their caregivers as Crypto is a zoonotic disease and is transmissible to humans.

The oocysts have a tough outer shell, making them resistant to commonly used farm disinfectants. Chlorinated cleaners or those containing bleach are not effective at “killing” the Crypto oocysts. The use of disinfectants having a 6 to 7.5% hydrogen peroxide base has been shown to be effective when allowed a contact time of at least 20 minutes. The oocysts are susceptible to heat shock (hot water) and desiccation (drying out) which allows for “deactivation”. Air-drying for 2 hours at room temperature has been proven to be lethal to the oocysts. If possible, managing calves within a facility as “all in and all out” is best to help break the disease cycle. Using concrete floors versus “dirt” allow for cleaning and disinfection of the floors and entire pen environment. At birth, reducing exposure to other cows in the calving area can decrease exposure as older animals can be asymptomatic carriers of Crypto.

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Take Home Points

Crypto is a common cause of diarrhea in calves under 3 weeks of age and is spread when calves ingest oocysts of a protozoan parasite found in feces. This disease is often not fatal and is self-limiting when it is the single cause of diarrhea. For the best outcome, scouring calves should be provided electrolyte solutions along with their milk to replace lost fluids and electrolytes, kept dry and warm, and have received 4 quarts of high quality colostrum within 6 hours of life. No drugs have been shown to be effective as a treatment. Also, no vaccines or feed additives are currently available as a preventative. Crypto is transmissible to humans, and as such, caretakers should wash their hands directly after caring for calves, irrespective of whether calves are visually sick or not.

Crypto is spread between calves exposed to a contaminated environment, clothing, or feeding equipment. Although this disease is hard to control on-farm, following strict hygiene practices can decrease exposure and severity of Crypto. Washing feeding equipment with hot water and soap and then allowing the equipment to completely dry can help decrease spread. As always, sick calves should be fed and cared for after others in the facility. Strict cleaning of a calf's housing between calves and allowing pens to completely dry also can help decrease the exposure and spread. With this disease, attention to details and strict hygiene practices are critical.