Cryptosporidiosis ("Crypto")

Summary:

- **"Crypto" is a small protozoa parasite which causes diarrhoea in young calves**
- **30% of calf rearing operations have a problem with Crypto**
- **The disease can be quickly controlled with aggressive oral rehydration—tube feed with electrolytes.**
- **Expect up to 30% of calves in an outbreak to be affected with around 10% mortality rate.**
- **A single calf can spread billions of these eggs, but it only takes ten to cause disease in susceptible calves.**
- **Symptoms are similar to rotaviris and salmonella.**
- **Confirmation is achieved by testing a sample of faeces from at least 4 affected calves.**
- **Calves with mixed infections e.g. crypto and rotavirus is common and can make up to 75% to 80% of the total calf deaths**.
- **The protozoa is not host specific and can infect humans, especially children. It results in abdominal pain and cramping with watery diarrhoea, nausea, loss of appetite and weight loss.**
- **Significant portion of calves shed *Cryptosporidium* species in their faeces, even though they are clinically healthy and exhibited no signs of disease. Also, the type of organism changes with advancing age, and presumably maturation of the calf's immune system.**
- **Older cows have a "mixed bag" of several species of *Cryptosporidium* and could realistically be considered a reservoir of infection for youngest animals.**

Introduction:

If you have a bout of Crypto in your calf shed you're not alone. Cryptosporidiosis is present in around 30% of calf rearing operations in NZ causing major problems. Infections by themselves are not associated with high mortality rates (around 10%), however when it is combined with rotavirus or salmonella death rates can be as high as 30% particularly where calves have not received adequate colostrum.

An outbreak of Crypto will typically affect up to 30% of the calves being reared with many calves not showing any signs, but they will spread the disease and it is for this reason the intensity of the infection increases as the calf season progresses due to increased contamination of the environment. Cryptosporidiosis usually originates from a point of infection (maybe one calf) and rapidly spreads to susceptible animals. Initially the incidence is low and peaks within 2-3 weeks.

The major effect on those calves that survive are poor growth rates for several weeks following recovery but with rapid rehydration, complications with secondary intestinal infections and reduced growth rates can be avoided.

The real costs of an outbreak of Crypto cannot be identified easily. We do know that experienced calf rearers work under tight time and budgets constraints and hospital mobs take a disproportionate amount of calf rearers' time.

Because scouring continues for a number of days, and younger calves seem to take longer to recover, treatment is extremely time consuming. This process is really tough on calf rearers.

The delay in reaching weaning weight targets means the number of calves being fed increases, further increasing staff workloads.

Calves with mixed infections e.g. crypto and rotavirus can make up to 75% to 80% of the total calf deaths, primarily due to bacterial infections leading to blood borne infections. This group may get significant benefit from antibiotic treatment.

What is Cryptosporidiosis?

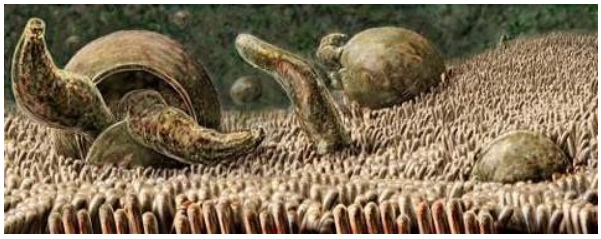
There are four species of the cryptosporidium parasite which infect cattle, but cryptosporidium parvum (C. parvum), a single-celled parasite, is found in many mammals including lambs, calves, goat kids, piglets and humans and is particularly common in calves under 6 weeks of age. Research so far has shown two basic types, the bovine type which affects most species, and a second human type which causes disease in humans only.

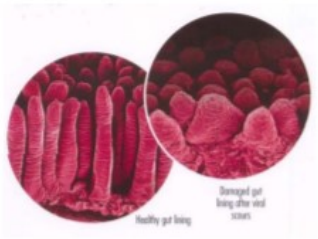
The protozoa is not host specific and can infect humans, especially children. It results in abdominal pain and cramping with watery diarrhoea, nausea, loss of appetite and weight loss.

Outbreaks of human disease, where large numbers of people are affected, are usually water-borne and usually associated with the bovine type of cryptosporidium.

Calves become infected with "Crypto" when they ingest C. parvum oocytes (eggs) which can be found in bedding, pasture, soil and drinking water. After four days, an infected calf will shed vast quantities of oocytes in their scour. A single calf can spread billions of these eggs, but it only takes ten to cause disease in susceptible calves.

The parasite infects the cells of the intestine, growing and multiplying and destroying the cells. The intestine has villi which are finger like projections and they are necessary for absorption of fluid and nutrients. As the cells die off the villi become damaged and very short, thus they can no longer absorb fluid and nutrients and thus scouring occurs.





Infection can occur at any age but is usually between 4 days and 4weeks. It is very rare in animals older than a month because by this age most animals will have become immune to infection.

The parasite has a complex life cycle and persistent infections can be established in the calf. Infection spreads rapidly between animals and persists in the environment for several months.

How can I tell if my calves have Crypto?

- The scour is generally very watery and results in severe dehydration.
- Typically scouring is 5-6 days but can be up to 12 days before the calf recovers its appetite for milk.
- It is very difficult to distinguish it from other causes without lab testing of faecal samples.
- Many calves with Cryptosporidia, Rotavirus and Salmonella scours lose their appetite.
- Scours from combined infections have a more severe and longer lasting effects.

- There are now tests which are available for use on-farm. Consult your vet on how to interpret any results.
- Alternatively, ask your vet for sample pottles, and take samples from a minimum of 4 scouring calves. Ask your vet to test to identify crypto, and to also test to exclude Rotavirus, Coronavirus, E coli and Salmonella.
- Many calves will have multiple infectious agents so veterinary advice will be important.

How do my calves get infected?
- On infected farms it is considered that some cows (typically 15%) may be shedding crypto at the time of calving (winter only).
- Any faecal matter on tractor trays used to carry calves, a shed used for calf rearing, implements used to feed calves, especially anything calves may find to lick or suckle.

What is the treatment?
- As with any cause of calf scours, treatment always consists of providing energy and fluids, therefore electrolyte therapy is the most important treatment, whilst maintaining milk intakes as well.
- Specific treatment of crypto involves the feeding of antibodies against crypto, by adding rotagen/crypto combo powder to the milk, or by administering the drug Halocur orally to each calf daily for 7days.
- Halocur is very effective but the safety margin is low, thus it is important to weigh calves and treat with an accurate dose. It is best used as a preventative.
- Remove from milk and feed electrolytes for 24 hours. Continued feeding of electrolytes between milk feeding is often required for a few days to support the calf. This allows the damaged gut to heal and helps hydrate the calf and restore the electrolyte balance.
- Halocur is a new drug which can be used to prevent and manage outbreaks of Cryptosporidiosis by reducing the number of oocysts excreted in the faeces.
- The use of high-quality electrolytes have been shown to reduce the convalescence period.
- Hygiene and cleaning of equipment, feeders and people (clothing, boots, hands) is very important.
- Spraying the calf shed with disinfectants can help reduce the level of infection.

Preventing C. parvum
Receiving adequate colostrum immediately after birth helps prevent invasion of opportunistic pathogens which can worsen or compound the severity of disease in calves with cryptosporidiosis.

The addition of Rotagen Combo, which contains specific immunoglobulins, to milk can be used as a preventative and treatment.

Preventing infection is the key way to manage or eliminate C. parvum on your farm. Hygiene is extremely important as C. parvum is transmitted from infective calves/cows that are shedding it into their manure, which gets ingested by calves.

Research has demonstrated that the maternity area can be an important source for infection due to the accumulation of cow faeces. Early separation of the calf (within one hour after birth) and an increased frequency of bedding changes will help to reduce the infection rate. Once calves move out of the calving area, a clean calf housing area is also extremely important.

Cleaning calf housing and feeding equipment with soap or detergent as well as ensuring bedding is changed or topped up frequently can prevent spread between calves. Hygiene is particularly important in the summertime as C. parvum survives in the environment for months when there are warm temperatures and high humidity.

C. parvum could also be combated through nutrition. A higher plane of nutrition (eight litres of milk per day or higher) has been shown to maintain hydration, have faster resolution of diarrhea, and improved growth and feed efficiency in calves challenged with C. parvum. The higher level of nutrition will not only protect against C. parvum, but also a number of other calf diseases, and can lead to a higher ADG in the pre-weaning period.

Once crypto is confirmed in a shed, it is recommended to treat all calves with Halocur for 7days including new calves. Bear in mind when dealing with calf scours that Cryptosporidia is able to infect humans so your own hygiene is most important.

Disinfection every day with Vetsan is recommended when an outbreak of scours is occurring, making sure that the floor, walls, calves and equipment are sprayed. Also, you will need to disinfect clothing and boots between infected and non-infected pens, or if possible, have a different set of overalls and boots for each.

Consider starting a new shed for newborns to reduce the spread. Once Cryptosporidia is in a calf shed it can be difficult to eliminate as it is hard to get enough disinfection on all surfaces and deep within bedding. Disinfection is still important though to decrease the contamination in the shed of cryptosporidia and other diseases that will take advantage of already sick calves.

At the end of the season it is advised to thoroughly steam clean your calf shed and then saturate all surfaces with Vetsan. Re-spray with Vetsan just prior to the next season once the bedding has been put down.

A recent study (Calf Note #227 August 2021) has found that with advancing age, the prevalence of *C. parvum* declined, and the type of organism changed. It was found that the proportion of *C. bovis* increased in the groups 1-2, 2-12, and 12-24 months. Older cows have a “mixed bag” of several species of *Cryptosporidium* and could realistically be considered a reservoir of infection for youngest animals.

Many studies have reported that *C. parvum* is the organism most commonly associated with cryptosporidiosis in young calves. It is thought that calves <1 month of age are particularly susceptible due to their immature immune system and as active immunity develops, calves become less susceptible to infection.

It’s also interesting to note that even though samples were taken from healthy animals, a significant percentage of animals were positive for *Cryptosporidium* in their faeces. Nearly 30% of calves <1 month of age were positive for *Cryptosporidium*, and mostly *C. parvum*. It’s important to note that C. parvum is zoonotic – that is, it causes disease in humans as well as calves. Therefore, special care should be taken by naïve individuals to avoid possible contamination with oocysts from young calves. Individuals with any type of immune suppression are particularly at risk and should avoid contact with young calves.

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https://www.calfnotes.com/Calf Note #227 – Recent research on cryptosporidiosis, part 1