

Section 6

Diarrhoea (scour)



Introduction

Scouring is the most common health problem affecting young cattle and milk-fed animals, and is the result of altered gut function which increases the amount of manure and fluids the calf eliminates. Calves are particularly susceptible during their second week of life. Up to 40% of calf deaths in the first six weeks of life are scour related.

- ① Causes of calf scour.
- ② Symptoms of scour.
- ③ Treatment of scour.
- ④ Why are electrolytes important?
- ⑤ Prevention of calf scour.
- ⑥ Coccidiosis.
- ⑦ Cryptosporidiosis.
- ⑧ *Rotavirus*.

Diarrhoea (scour)

① Causes of calf scour.

Scours can be classified into two types: nutritional and infectious. Nutritional scour is usually caused by stress due to a breakdown in management routine. Nutritional scour often progresses to become an infectious scour, which is caused by a high population of pathogens.

A number of infectious agents can cause scour in calves and often more than one of them is involved:

	Cause of calf scour	Age at which clinical signs most commonly appear
Parasites	<i>Cryptosporidia</i>	First week of life
	<i>Coccidia</i>	3-6 weeks of age
Viruses	Rotavirus	1-3 weeks of age
	Coronavirus	1-3 weeks of age
Bacteria	<i>Salmonella</i>	2-6 weeks of age
	<i>E. coli</i>	Calves <5 days of age

KEY POINT:



Calfhood diseases have a major impact on the economic viability of cattle operations due to both the direct costs of calf losses, the treatment required and the long term effects on animal performance.

② Symptoms of scour.

Calf scour is easily recognised, with calf faeces increasing in frequency and quantity, and having a higher than normal water content. Whatever the cause, farmers will see some or all of the following:

- Bright yellow or white faeces.
- Depressed calves who are reluctant to feed.
- Calves with sunken eyes and/or a temperature.
- Skin remaining peaked or tented when lifted, indicating dehydration.
- Weight loss and weakness.
- In severe cases, calves will collapse, become comatose and die.



Bright yellow faeces are a predominant symptom of calf scours.

Estimation of hydration status in calves with diarrhoea.

Dehydration	Attitude	Eyeball recession	Skin tent (seconds)
<5%	Normal	None	<1
6-8% (mild)	Slightly depressed	2-4mm	1-2
8-10% (moderate)	Depressed	4-6mm	2-5
10-12% (severe)	Comatose	6-8mm	6-10
>12%	Comatose/dead	8-12mm	>10

Source: Smith, 2009. *Vet. Clin. North Am. Food Anim. Pract.*, 25; 55-72.

With careful observation, it is possible for calf rearers to anticipate the onset of scour the day before it occurs by looking out for the following signs:

- Dry muzzle, thick mucus appearing from the nostrils.
- Very firm faeces.
- Refusal of milk.
- A tendency to lie down.
- A high body temperature (over 39.5°C).



A rectal temperature above 39.5°C indicates calves that are likely to be developing scours.

③ Treatment of scour.

Although specific treatments are available for scour depending on the causal pathogen, the following steps should be taken in all cases to ensure calf recovery:

I. Isolation

- Scouring calves should be isolated in a clean, dry and warm pen.

II. Rehydration therapy

- Calves must receive sufficient liquid and electrolytes to replace those lost in the faeces.
- Frequent, small, feeds of electrolytes or milk are better than fewer larger ones.
- Healthy calves need up to four litres of fluid a day, and scouring calves need an additional four litres to replace lost fluids.

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- Electrolyte scour treatments must have a Strong Ion Difference (SID) of 60mmol.

III. Milk feeding

- Continuing to feed milk or good quality milk replacer will not prolong or worsen the scour and can help to heal the intestine.
- Continue to offer scouring calves normal amounts of milk or milk replacer for as long as they want to drink it.
- If reintroducing milk, it should be offered full strength. Milk should never be diluted with electrolyte solutions as this can lead to poor milk clotting.
- Electrolytes should be given at least 30 minutes before a milk feed.
- Milk or milk replacer should not be stomach tubed.

IV. Antibiotics

- Antibiotics do not work against the parasites and viruses which are the most common causes of calf scour.
- Antibiotics should be given, by injection, only when the calf looks very sick or has a temperature outside of the normal range of 38.5 to 39.5°C.

KEY QUESTION:



Should I take dung samples from calves with scour and send them to the laboratory?

Yes, in the following cases:

- Calf scour is a regular occurrence on your farm.
- A number of calves have scour at the one time.
- The treatment that you normally use doesn't work.



Faecal samples should be taken directly from the animal rather than the pen floor.

4 Why are electrolytes important?

Once scouring, a calf becomes rapidly dehydrated, acidotic, and low in essential electrolytes such as sodium (Na), Potassium (K), and Chloride (Cl). They can lose 5% to 10% of their body weight daily in fluids. Treatment involves rehydration, correction of acidosis, and replacement of electrolytes.

Some electrolyte products on the market, while assisting with rehydration and replacement of electrolytes, often fail to effectively correct acidosis. Correcting acidosis is essential for calf recovery. This has led to the introduction of new legislation across the EU (EU regulation No. 1123/2014) which requires that all scour treatments must have an SID of at least 60mmol/litre which will assist in

correcting acidosis. Research shows that products meeting this specification restore blood pH and base excess within a 12-18 hour period and facilitate a quick and full recovery of calves from scour.

KEY POINT:



Products meeting the SID requirement will state that they are fit for the “stabilisation of water and electrolyte balance to support the physiological digestion”. Products with an SID of less than 60mmol/litre will only state that they are “complementary feeds”.

How much electrolytes are required?

The amount of electrolytes needed depends on the extent of the calf’s symptoms. Overfeeding electrolytes causes little detriment to calves. However, underfeeding electrolytes can prolong scours and not correct the dehydration and loss of electrolytes.

Calf Symptoms	Dehydration %	Daily amount of electrolytes needed for 45kg calf	Total daily amount of fluids (milk + electrolytes)
Scours Strong suckling reflex Skin tent returns to normal in less than 2 sec	5-6%	3L of electrolytes plus 4-6L of milk	7-9L
Scours Calf still has suckling reflex Skin tent returns to normal in 2-6 sec Sunken eyes Mild depression; calf may be weak	6-8% (moderately dehydrated)	4L of electrolytes plus 4-6L of milk	8-10L
Scours Calf lying down; rises only when encouraged Skin tent returns to normal in >6 sec Very sunken eyes; white and dry gums Calf depressed; calf may be weak	8-10% (severely dehydrated)	Metabolic acidosis- intravenous fluids needed to correct blood pH caused by imbalance of acids and bases in the blood	Contact your vet
Death	Over 14%		

Adapted from an article by D.M. Amaral-Phillips (2012), University of Kentucky.

5 Prevention of calf scour.

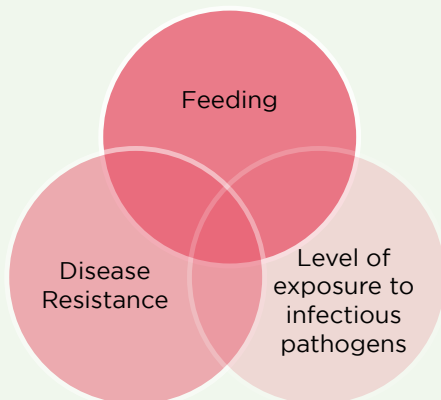
Whether a calf stays healthy or gets scour is determined by the balance between the resistance of the calf to infection and the level of infection to which it is exposed.

- Provide adequate colostrum in the first few hours after birth.
- Provide proper housing or shelter from the weather to reduce stress.
- Carefully plan shed designs to avoid overcrowding.
- Avoid mixing different ages (i.e. new born calves with calves older than 3-4 days) as younger calves will be more susceptible.
- Minimise stresses associated with routine management practices e.g. disbudding, castration.
- Maintain strict hygiene by cleaning and sterilising feeding utensils and facilities.
- Prevent the build-up of faecal contamination around feed and water troughs. Raise feeding and

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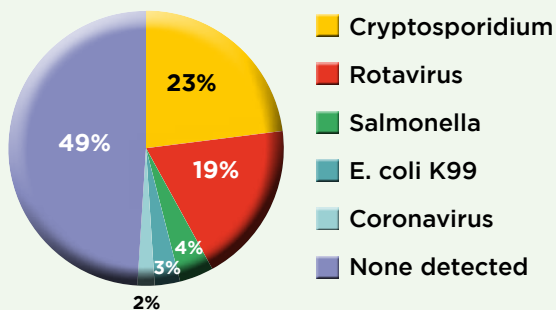
water troughs off the floor, to at least 0.75m.

- Individual or group calf pens/hutches must be cleaned out and disinfected between animals.
- Clean out bedding regularly or generously top up a straw bed. Check bedding by kneeling in the pen; your knees should not get wet if the bedding is dry enough.
- Develop a routine milk feeding program with as few people involved as possible.
- Respond quickly to symptoms of scour; isolate sick calves and address the cause.
- Purchase calves from cows that have been vaccinated with a scour vaccine before calving. The vaccinated cow produces more antibodies to rotavirus, coronavirus and *E.coli* and delivers them in her colostrum.



KEY FACTS:

In Ireland, *Cryptosporidium* and *Rotavirus* are the two most common causes of calf scour.



The relative frequency of enteropathogens identified on post-mortem submissions of calves less than one month of age to DAFM RVLs during 2012. Source: All-island Animal Disease Surveillance Report 2012: A joint AFBI / DAFM Veterinary Laboratories publication.

6 Coccidiosis.

Coccidiosis is usually seen in calves from three weeks to about nine months of age. Infected calves excrete vast numbers of oocytes which then contaminate the environment for other calves. Resistant oocytes can survive for long periods.

Although cattle develop immunity to the condition over time, young calves with an underdeveloped immune system placed in a dirty environment can acquire the disease.

Symptoms

- A watery scour due to damage of the intestinal mucosa.
- Calves become dehydrated, may start to pass blood, shed part of the intestine lining and can become weak and uncoordinated.
- In many herds there may be sub-clinical infection where animals show very few symptoms and will recover with time but thrive will be affected.

Treatment

Where a farm has had previous trouble with *Coccidia*, farmers must be particularly vigilant as it can reoccur, especially where hygiene is poor.

- Prophylactic dosing of calves with Vecoxan (diclurazil) or Baycox (toltrazuril) is common.
- Typically calves are given an oral dose of between 20-30ml depending on the weight of the calf.

Prevention

- Maintain calf housing in a hygienic manner.
- Use effective disinfectants.
- Provide clean dry bedding.
- Raise troughs off the ground and clean regularly.
- Turn calves out onto pasture which has not been grazed by calves in over a year.

7 Cryptosporidiosis.

Cryptosporidium parvum is the causal pathogen of Cryptosporidiosis, which generally affects calves in the second week of life, although calves from five to 35 days are susceptible. The infection causes severe damage to the lining of the gut wall and destroys the calf's ability to absorb nutrients

The parasite is transmitted via the faecal-oral route, with calves becoming infected from calf pens, utensils or farm worker's clothing which has been contaminated with dung containing the parasite.

Diagnosis

It is difficult to distinguish cryptosporidiosis from other types of scour because the clinical signs are non-specific.

- Submit faecal samples (in sterile containers) from untreated, scouring, calves to the local vet or laboratory in the early stages of a disease outbreak.
- Take dead calves to the Regional Veterinary Laboratory for a post-mortem.



The optimal calf rearing system to control cryptosporidiosis is to rear calves in individual pens for at least the first two weeks.

Symptoms

- Persistent diarrhoea that is extremely difficult to cure.
- Calves become lethargic, stop drinking and can become dehydrated quickly.
- Once infected, calves will begin to shed vast quantities of oocysts in their scour after four days, leading to contamination of other calves with the infection.
- Where mixed infections (e.g. with *Rotavirus*) occur, mortalities can be high.

Treatment

- Calves must remain on milk and electrolyte therapy so that they are kept nourished and do not become dehydrated.
- The only licenced product that can be used therapeutically, or as a preventative, is Halocur (halofuginone lactate).
- Where there is a farm problem, calves should be given Halocur in the first 24 hours after birth. Halocur must be given daily for a further seven days. A typical 45-50kg calf will need 10ml/day for eight days.
- All unaffected healthy calves should be moved immediately from the contaminated environment.



Halocur is given daily for the first week of the calf's life to prevent cryptosporidiosis.

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KEY POINT:

Cryptosporidium parvum can infect humans. Farm workers should wash their hands, change their clothes and footwear after handling sick calves. Children and immunocompromised adults should not care for sick calves. Farm owners should comply with all the regulations on slurry and run-off water from animal buildings.

8 *Rotavirus.*

Rotavirus is present in most cattle herds and typically causes diarrhoea in calves five to 14 days old. *Rotavirus* infections are self-limiting because once the epithelial cells are dead, the virus does not have anywhere to replicate. Transmission generally occurs as a result of oral contact with infected faeces.

One of the major sources of rotavirus infection is carrier cows showing no symptoms and shedding the virus around the time of calving.

Symptoms

- Pale yellow diarrhoea, sometimes with mucous and blood flecks. Usually lasts four to eight days.
- Calves can become dehydrated and pick up secondary infections.
- Some calves may drool and some may be seen to continually attempt, and fail, to defecate.
- In calves older than four weeks of age, there are often no signs or symptoms at all following re-infection.

Treatment

- Routine fluid therapy is the most important line of treatment aimed at correcting dehydration, electrolyte imbalances and acidosis brought on by fluid loss and the decreased absorptive capacity in the intestine.
- Antibiotics can reduce secondary bacterial infection.
- Cows can be vaccinated to increase the amount of rotavirus antibodies in the colostrum. If such colostrum is given to the calf within 12 hours it can provide protection for at least seven days.

