Farmer's Guide to Scour

We are all aware that calf scour can be a major problem for both dairy producers and beef suckler farmers. In this article, we will look at the 3 most important things to consider when attempting to lessen the impact of scour on our farms.

1. Causes of scour
2. Treatment of individual scouring calves
3. Prevention of scour

Causes of Scour

Calf scour is an infectious disease, meaning it is primarily caused by infection with one or more microorganisms (more accurately referred to as pathogens, which means 'disease-causing'). Nowadays we realise that in most cases of severe scour or outbreaks of scour, other factors are at play which reduce the ability of the calf to defend itself against the infection.

There are 4 commonly recognised pathogens which cause scour. In order of how frequently they are isolated from scour samples in the laboratory, these are:

1. Cryptosporidium – a single-celled parasite, found in around 45% of diagnosed cases
2. Rotavirus – around 40%
3. Coronavirus – approximately 10% of isolates
4. Enterotoxigenic *E. coli* – a specific scour-causing bacteria, around 5%

All of these pathogens are ingested into the gut when the calf consumes material contaminated with infected dung. In the gut, these pathogens multiply and attack the cells lining the small intestine. The damage caused to the digestive processes results in the leakage of fluid into the gut and the impaired digestion of milk. The faeces become watery and the calf develops diarrhoea, becoming dehydrated and weak. The original source of the infections is often the dung of adult cattle, as these animals carry the pathogens in their gut without experiencing any ill-effects due to the strength of their fully developed immune system. It is when hygiene breaks down and too many pathogens infect newborn calves that serious scour problems occur.

In all cases the pathogens multiply inside the gut and are released in vast numbers in the diarrhoea. The infection spreads when healthy calves have direct contact with scouring calves, are fed from contaminated buckets, or lick bars, walls and bedding which have been scoured upon. Severe cases/outbreaks of scour often involve more than one of these pathogens, with Rotavirus and Cryptosporidium commonly found together.

Calves are exposed to these pathogens from birth, usually ingesting them in the first few days of life. An incubation period of a 2–4 days means that we usually see calves with clinical scour from about 5 days of age through to about 14 days. This varies a little from one pathogen to another but because there is so much overlap it is impossible to tell which pathogen is the problem without laboratory testing of a fresh sample of the diarrhoea (less than 24 hrs established).

E. coli is an exception to this as most cases will be in calves less than 3 days of age.

Treatment of the Scouring Calf

The impaired ability of the calf to digest milk and the loss of fluid in the diarrhoea has 3 main effects on the calf.

1. Dehydration
2. Acidosis: excess acid in the blood
3. Weakness and weight loss

These symptoms combine to produce the clinical picture we see in the typical scour case. The calf is dull, slow to rise and doesn't stretch, has a poor or non-existent appetite and rapidly becomes empty-looking and thin.

At the first sign of diarrhoea, even if the calf appears quite bright initially, it should be offered 2 litres of Oral Rehydration Solution (ORS) twice daily in addition to its milk feed (we no longer withhold milk from scouring calves – this has been shown to be very harmful as it only increases the energy deficit).

A good ORS contains electrolytes which help the calf absorb water and correct dehydration, buffers which neutralise the acid, and readily absorbable energy for heat generation (scouring calves develop hypothermia very easily), and to maintain the calf's bodyweight.

The prompt use of an ORS two or three times a day is the primary treatment for cases of scour. If we can quickly correct dehydration and replace the lost energy, we may be able to prevent deterioration of the calf's condition.

If the calf deteriorates despite the use of an ORS, it may need to be treated with intravenous fluids by a vet. This is particularly important if the calf collapses and is unable to stand, or has no suckle or feed reflex. In these severe cases the vet may use other injectable medicines they deem appropriate.

The use of an activated charcoal gel to absorb the liquid and gas from the gut contents and create a more normal dung can make the calf more comfortable. Activated charcoal can also absorb toxic products of the infection, stopping them from being absorbed into the calf's circulation. This treatment may be useful in milder cases of scour where the calf is still reasonably bright.

In all cases of scour, good nursing is vital. Keeping the calf warm, dry, and free from draughts is a must. A heat bulb will always be beneficial if the weather is colder. If the calf is weak, helping it to its feet on a regular basis to prevent cramp and encourage fluid or food intake is good practice. At the end of the day, the damaged gut will take at least a few days to heal, and our goal is to make sure the calf has every chance to come out the other side. There are no magic cures, good husbandry of the sick animal is the main factor in survival.

Prevention of Scour
The pathogens which cause calf scour are carried asymptomatically in the faeces of most adult cattle, therefore we can assume that most calves will likely be exposed to them if they encounter dung in the first few days of life. The reason why not all calves suffer from scour is that they have sufficient immune defences to prevent the pathogens from causing excessive damage to the lining of the gut. When scour has become a problem on our farm, we can be sure of two things:

1. The sheer number of infectious particles in the environment has become extremely high.

2. The immune system of the calf has insufficient power to combat this level of infection pressure.

We need to address both issues.

To Reduce Infection Pressure
Immaculate hygiene in our calving areas, rearing pens and creep areas will hopefully limit the number of pathogens that get into the calf's gut. Removal of the dairy calf from the dam immediately after birth is a good idea as the dam's dung, dirty teats, tail switch etc can all present an infection risk. In an outbreak situation, providing a brand-new rearing area to which calves can be taken immediately after birth is the best way to break the cycle of scour. This may be indoor pens made from straw bales, clean calf igloos or a polytunnel.

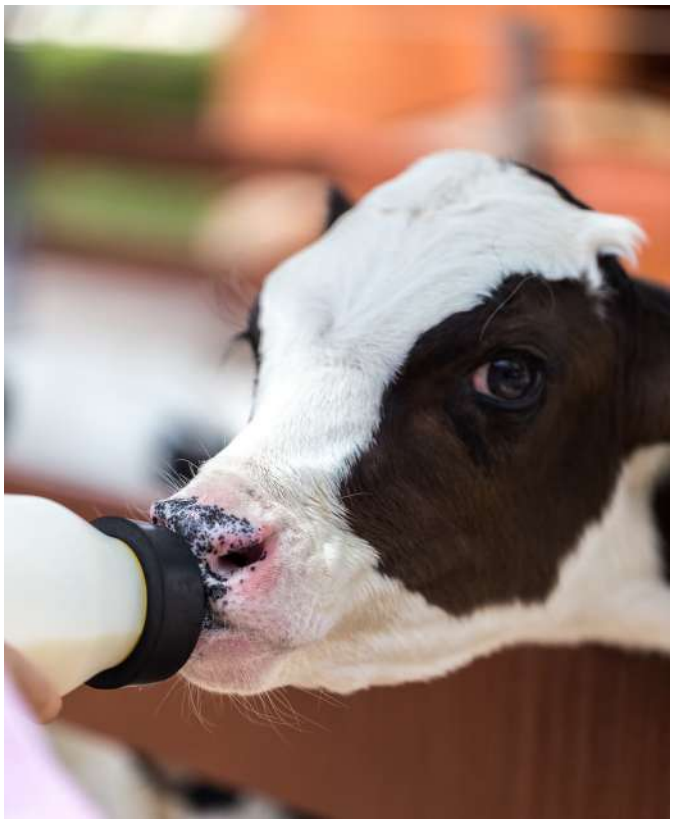
To maximise the calves' immune strength there are several important principles:

1. **Good management and nutrition:** Without going into detail, a comfortable, warm, well-fed calf is a happy calf and will have a lower level of stress hormones which lower the immune response. Look after these calves like the newborn babies they are.

2. **Colostrum:** We all know the importance of adequate intake of high-quality colostrum. Colostrum contains a broad array of antibodies against all the diseases the cow has encountered in her life on the farm. While it is not guaranteed that all colostrum will contain enough of the specific anti-scour antibodies that the calf needs in every case, meticulous attention to a thorough colostrum protocol for each calf is vital to protect against scour. While the level of antibodies in the colostrum decreases dramatically after the first milking, feeding transition milk will contain enough of these antibodies to extend the protection for the next few days. In troublesome scour outbreaks transition milk feeding should be considered.

3. **Vaccination against scour:** Dry cow vaccination against Rota, Corona and *E. coli* K99 aims to 'encourage' the cow to produce more of the antibodies against scour than she would normally. The response to vaccine cannot be guaranteed in every case, but at a herd level it is an excellent and cost-effective way to try to boost the antibody protection that ends up inside the newborn calves. Howver, in severe pathogen challenge, even vaccinated herds can experience problems.

4. **Consider use of a bovine concentrated lactoserum (Locatim®):** This is a prescription medicine available from your veterinary surgeon, it is not an antibiotic. A 60 mL oral dose contains a protective quota of antibodies against the causes of calf scour. When given to a newborn calf immediately after birth it boosts the specific immune protection against scour. The normal cow's colostrum feed is given afterwards. This will protect the newborn calves in the face of an outbreak while the control measures outlined above take effect.



Summary
Among the domesticated farm species, calves are most at risk from losses due to scour. Constant vigilance is essential to prevent the (inevitable) occasional case of scour from becoming an outbreak. Success in maintaining very low losses from scour will come from good dry cow nutrition ensuring quality colostrum production, excellent colostrum management and administration, hygiene in the calving pen and calf accommodation, and rapid identification, quarantine and treatment of clinical cases. Each farm should have a tailored strategic approach to scour prevention which has been agreed upon by the veterinary team and farm management. By following this plan, both the calf crop and the farm finances will remain healthy.

Dr. John Henderson

Dr. John Henderson, BVM&S MRCVS, is a qualified as a vet from Edinburgh Vet School in 1994. Apart from a 2-year stint as a disease surveillance officer for the SAC (SRUC), spent all working career in general first opinion practice. Most of these years were in mixed, predominately farm work but with a couple of periods in 100% equine and 100% small animal. Since 2018 have been combining practice with working for Forte Healthcare, an Irish veterinary pharmaceutical company where my main focus is helping to develop and introduce effective non-POM therapies to the livestock sector.