A GUIDE FOR FARMERS

MANAGING A CALF SCOUR OUTBREAK

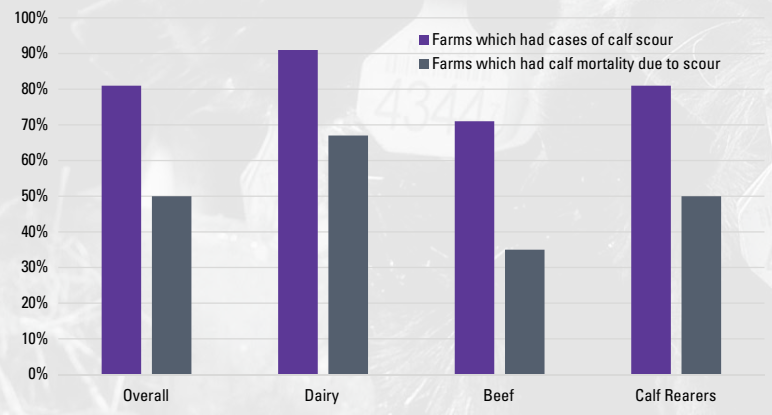
- MAXIMISING CALF IMMUNITY
- PATHOGEN IDENTIFICATION
- SCOURING CALF MANAGEMENT

MSD Animal Health

CALF SCOUR IS THE MOST COMMON CAUSE OF MORBIDITY AND MORTALITY IN THE PRE-WEANING PERIOD.[1]

It can cause extensive gut damage leading to reduced lifetime performance and increased susceptibility to other conditions (e.g. BRD).[2] Costs are estimated at £57.94/head but this does not include the longer term impacts of this condition.[3] Its prevention is critical to preserving the future productivity of the calf.[4]

A farmer survey showed the huge impact of scour on different types of UK farms over the past 12 months:[5]



Resolving scour outbreaks speedily enables the farm to focus efforts on preventing disease in order to minimise it's impact on lifetime performance.

MANAGING CALF SCOUR OUTBREAKS

Occasionally, even with good prevention protocols in place on-farm, scour outbreaks can occur. When it does, management of the outbreak should focus on these three key areas to resolve the outbreak as quickly as possible:

1 MAXIMISING CALF IMMUNITY

2 PATHOGEN IDENTIFICATION

3 SCOURING CALF MANAGEMENT

MAXIMISING CALF IMMUNITY

1

Irrespective of the pathogen(s) causing the scour, maximising calf immunity via excellent colostrum provision and vaccination is the foundation of scour prevention and management.

Actions should focus on the 5 Qs of good colostrum management but there are some additional actions which can be adopted during an outbreak:

1 QUALITY

Only feed good quality colostrum checked using a colostrometer or Brix refractometer.[6,7] Boosting colostrum quality via dam vaccination can also help maximise the protection colostrum gives the calf.

2 QUANTITY

Give at least 4 litres (or 10% of bodyweight) of good quality colostrum within 4 hours of birth. A further 2 litres should be given within 12 hours of birth.[8,9] Tube feeding the calf ensures the correct volumes are given – your vet will be able to offer guidance on how to do this correctly.

3 QUICKLY

The earlier colostrum is given, the quicker protection can be gained – this is particularly important in the face of an outbreak. Giving some colostrum daily over the first 5-7 days is also useful to reduce the impact of pathogens in the gut.[10]

4 SQUEAKY CLEAN

Poor cleanliness and hygiene of colostrum collection, feeding and storage equipment can lead to failure of passive transfer (FPT) of immunity from dam to calf. Cleanliness and hygiene are especially important in the face of an outbreak where pathogen load could be very high.[9,11]

Your vet can test for bacterial counts in colostrum and collection/feeding equipment to rule this out as a reason for the scour outbreak.

5 QUANTIFY

Your vet may also check colostrum feeding records and cross-reference calf passive transfer blood test results to identify if FPT is a key reason for the outbreak.[7,12] This is an important step to stop the scour issue continuing on your farm.

PATHOGEN IDENTIFICATION 2

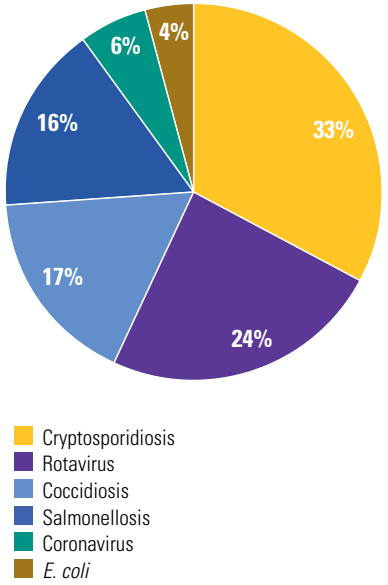
Identifying pathogens involved in scour will guide treatment, management and prevention strategies which will help to reduce scour outbreak incidence and severity.

WHAT PATHOGENS ARE ON YOUR FARM?

Faecal sampling is the easiest and quickest way of identifying the common agents involved in scour. On-farm test kits can identify rotavirus, coronavirus, *E. coli* and *Cryptosporidium*.

Samples should be collected from 5 calves (samples should not be collected from the floor or from calves which have received antibiotics) to see if there are common pathogens causing scour on the farm.[13]

Calf diagnoses by pathogen 2019-2023.[14]



ROTAVIRUS, CORONAVIRUS OR *E. COLI*

These organisms are often excreted by adult cattle and are hard to eliminate on-farm entirely.

Focusing on improving colostrum management, dam vaccination to boost colostrum and improving hygiene will help minimise the impact of these pathogens.

CRYPTOSPORIDIUM

Cryptosporidiosis is the most common cause of calf scour and requires a specific management process as it is highly infectious and very difficult to eliminate from the farm.

You should discuss specific treatment and management protocols for your farm with your vet. The 5-step action plan on the page opposite is a useful place to start.[15]

CRYPTOSPORIDIUM MANAGEMENT ACTION PLAN	
1 DIAGNOSE	As treatments can differ depending on the pathogen(s) involved, even when the cause is suspected from clinical signs, faecal samples should be taken and a pathogen identification kit used to get a definitive diagnosis.
2 ENVIRONMENT AND MANAGEMENT	This is a critically important step, without which you are unlikely to control *Cryptosporidium*. **Pens should be mucked out, steam cleaned, disinfected and left to dry** as frequently as practically possible. It is important that pens are allowed to dry fully as survival of the *Cryptosporidium* oocysts is greatly reduced in dry conditions. **Use disinfection on entrances** to calf sheds. Many common farm disinfectants are not effective against *Cryptosporidium*, so you need to ensure you use **a disinfectant which is licensed and effective such as 2-3% Keno™Cox**, which kills 99% of oocysts after 2 hours contact time. **Do not mix calves of different ages** – older calves can be immune but continue to shed oocysts which then infect the younger naïve calves. **Do not mix sick calves back with healthy calves** until at least 1 week after scouring has stopped. **Isolate sick calves** especially once scouring starts, and keep them **warm and hydrated**. **Tend to healthy calves before sick ones** – to minimise cross-contamination to the healthy herd.
3 COLOSTRUM	Implementation of the 5 Qs of colostrum management is critical to ensure calves have the best immune status possible and are able to defend themselves against infection. Improving colostrum provision can also protect against infection with other scour pathogens, which increase the calf's vulnerabilty to *Cryptosporidium* and also the clinical impact of infection.
4 PREVENTION	The cause of scour is often multi-factorial so control requires a holistic approach optimising biosecurity, nutrition and vaccine policies. **Vaccinate the dams** with Bovilis® Rotavec® Corona and Bovilis Cryptium® to improve colostral quality – this improves calf resistance to cryptosporidiosis as well as concurrent infection with rotavirus, coronavirus and *E. coli* making them less vulnerable to infection with *Cryptosporidium*.
5 TREATMENT	Halocur®, which contains halofuginone, reduces oocyst excretion and the severity of calf diarrhoea. It can be used to treat or (ideally) prevent *Cryptosporidium*.

NEGATIVE RESULTS BUT CALVES ARE SCOURING – WHAT NEXT?

If all calf-side tests which identify rotavirus, coronavirus, *E. coli* and *Cryptosporidium* come up negative, it is advisable to discuss the scour outbreak with your vet if you have not done so already.

Other pathogens which could cause scour include salmonella or coccidiosis; to identify if this is the cause fresh samples will need to be collected and sent for lab analysis.[13]

If these also come back as negative it could suggest that the reason that calves are scouring is environmental or nutritional. Your vet will be able to investigate the source of scour and advise how best to manage it.

CREATING AN ACTION PLAN

Once you have identified the pathogens present in calf scour it is important to work with your vet to investigate the source of the pathogens and why they have caused scour in your calves. This will involve clinical examination of calves, assessment of calf environment and review of your calf management protocols.

Once all this information has been gathered you can work with your vet to establish an effective treatment regime for your farm to get on top of the current outbreak and to prevent the outbreak from occurring again.

SCOURING CALF MANAGEMENT 3

With calf immunity maximised and the contributing pathogens identified, scour on the farm should soon reduce, however you also need to manage sick calves and their environment to minimise the impact, spread and recurrence of scour.

CALF ISOLATION

Scour is spread easily between calves via the faecal-oral route, therefore remove scouring calves from the group to help prevent the spread of infection and make sick calves easier to treat.

Calves should be isolated in separate air spaces to other calves and the adult herd to minimise any cross-contamination. Scouring suckler calves should be isolated with their dam.

You should aim to work with the isolated group last so you do not spread any pathogens from the sick group to the healthy calves.

Calves should not return to the healthy group but remain in a "recovery group" as they can shed infectious agents even after scour symptoms have waned.

CALF REHYDRATION

Scour leads to dehydration, electrolyte imbalances and negative energy balance – correcting this is the mainstay of treatment as dehydration is the primary cause of death due to scour. Ensuring plenty of fresh, clean water is available is important to supporting a scouring calf. Rehydration therapy can also provide benefit in the event of a calf not finishing its normal milk ration or during periods of hot weather so should be considered.

It is critical that in addition to rehydration therapy you continue to feed scouring calves their normal milk ration as they will need this nutrition to help them recover.

The table opposite can be used to guide the different actions you can take to correct hydration levels in scouring calves, however if you need assistance call your vet.[16]

Dehydration	Fluid deficit (for 40kg calf)	Dehydration signs	Calf behaviour	Action
0-3%	<1.2 L	Scouring, no other visible signs		ORT
4-7%	1.6-2.8 L	Slightly sunken eyes, pinched skinfold takes 4-5s to flatten		ORT (consider IVFT)
8-12%	3.2-4.4 L	Sunken eyes, pinched skinfold takes >5s to flatten, cold ears and legs		ORT & IVFT
>12%	>4.8 L	Deeply sunken eyes, dry and tight skin, cold ears and legs		IVFT

Oral Rehydration Therapy (ORT)[16]	Intravenous Fluid Therapy (IVFT)[17]
ORT should start as soon as scour is observed and continue for at least 48-72 hours. You can calculate the amounts of fluids a scouring calf requires using this simple formula: $\frac{\text{Calf's body weight } \mathbf{X} \text{ (estimated dehydration \%)}}{100}$ = quantities to be fed in addition to milk/day (litres) The calf should be given the ORT spaced equally between receiving its milk ration. If the calf is unwilling to drink it from a bottle then it can be given by a stomach tube (your vet will be able to show you how to do this if you are not confident).	If your calf is severely dehydrated you should call your vet who will be able to administer IVFT. Once IVFT has restored the fluid balance of your calf it is important to continue to provide ORT as guided by your vet to aid recovery.

HYGIENE OF THE ENVIRONMENT AND EQUIPMENT

Ensuring environmental and equipment hygiene is critical to reducing the infectious load in the environment.

Calving pens should be routinely cleaned and disinfected after each calving and calf housing should also be cleaned, disinfected and allowed to dry regularly.

Feeding equipment should also be cleaned, disinfected and dried after each use.

It is important to ensure the correct disinfectants are used in the correct concentrations and allowed to stand for the correct contact times. For further information please visit: http://disinfectants.defra.gov.uk

Isolated groups should have dedicated equipment which is not used in the healthy group to help minimise the spread of pathogens through cross-contamination.

SUPPORTIVE TREATMENT

NSAIDs: Scour can be painful. Improving the comfort of a scouring calf by giving anti-inflammatories may improve its rate of recovery.[18]

Antibiotics: Often antibiotics aren't effective against scour pathogens as most are viral/parasitic – your vet can advise if it is appropriate to use antibiotics for the scour on your farm.[15]

Scour pastes: There is little evidence for the benefit of scour pastes. It has been shown that they are not a suitable alternative to colostrum from an immunological perspective; the focus of immunity maximisation should remain focused on good colostrum provision and vaccination.[19]

ENVIRONMENTAL MANAGEMENT

If calves are cold, energy reserves will be used up keeping warm rather than fighting the infection.

Heat lamps, calf jackets, increased warm, dry bedding, minimising moisture and pain relief are important for preserving warmth and comfort and give them the best chance to fight infection. The calf's environment should also drain well as a damp environment is a cold environment.

Calves of different ages should be housed separately and the stocking density should not be too high. The following stocking densities according to animal weight are recommended:

- <150 kg: 1.5m²
- 150-200 kg: 2m²
- >200 kg: 3m²

Housing should also be well ventilated (without being draughty) as fresh air has been shown to reduce the survivability of pathogens in the environment.[20]

The goal of outbreak management is to resolve the immediate outbreak as quickly as possible to return focus to disease prevention.

MANAGING A SCOUR OUTBREAK – QUICK REFERENCE GUIDE	
Maximising calf resistance 	• Follow the 5 Qs of colostrum management. • Work with your vet to check for FPT and bacteria levels in colostrum and on equipment.
Pathogen identification 	• Detect pathogens in at least 5 calves. • Work with your vet to develop a management plan based on the pathogens and risk factors contributing to the outbreak on your farm.
Scouring calf management 	• Isolate to minimise the spread. • Rehydrate. • Ensure environment and feeding equipment are cleaned and disinfected appropriately. • Make calves as comfortable as possible to aid their recovery.

A calf with scour is a serious problem and you should always call your vet if you are encountering any of these problems on your farm:

- You have an increased number of scouring calves.
- The scouring calf refuses to drink several feeds in one day.
- The scouring calf is down or very weak and does not improve in 6-12 hours after oral rehydration.
- The scouring calf is visibly dehydrated (as intravenous rehydration will be needed).
- The calf's temperature is above or below the normal range (38.5°C - 39.5°C).
- Calves have blood in their faeces.
- Calves are dying.

This guide has been developed as part of the MSD Animal Health Enteric Programme.

BOVILIS Rotavec Corona | BOVILIS Cryptium | BOVILIS Bovivac S | Halocur | Vecoxan®

References:

1. Wathes DC, Brickell JS, Bourne NE, *et al.* Factors influencing heifer survival and fertility on 314 commercial dairy farms. Animal 2008;2:1135-1143.
2. Heinrichs A & Heinrichs B. (2010) A prospective study of calf factors affecting first-lactation and lifetime milk production and age of cows when removed from the herd. J. Dairy Sci. 94:336-341.
3. ADAS Economic Impact of Health and Welfare Issues in Beef Cattle and Sheep in England (2012).
4. Button E. (2020) Calf disease: an immunological perspective. Livestock. March/April.
5. MSD Animal Health National Youngstock Survey 2020.
6. Potter T. Colostrum: Getting the right start. UK-Vet 16 Livestock. 2011; 16:25-7.
7. Tilling O. (2020) Colostrum. Livestock. March/April.
8. Weaver DM, Tyler JW, VanMetre DC, Hostetler DE, Barrington GM. Passive Transfer of Colostral Immunoglobulins in Calves. J Vet Intern Med. 2000; 14(6):569-77.
9. Godden S. Colostrum Management for Dairy Calves. Vet Clin North Am Food Anim Pract. 2008; 24(1):19-39. doi: 10.1016/j.cvfa.2007.10.005.
10. Blowey RW. A Veterinary Book for Dairy Farmers (3rd Edition). 1999. Farming Press.
11. Denholm K & Haggarty A. (2019) Exploring failure of passive transfer and colostrum quality in Scottish dairy calves. Cattle Practice. Vol 27. 2.
12. Beam AL, Lombard JE, Kopral CA *et al.* Prevalence of failure of passive transfer of immunity in newborn heifer calves and associated management practices on US dairy operations. J Dairy Sci. 2009; 92(8):3973-80. doi: 10.3168/jds.2009-2225.
13. Bazeley K. (2003) Investigation of diarrhoea in the neonatal calf. In Practice (March).
14. UK Veterinary Investigation Diagnosis Analysis (VIDA) Cattle Surveillance Dashboard data. Incorporating calf (neonatal, preweaned and postweaned) data only.
15. Wells B. (2014) Cryptosporidiosis in Cattle. The Moredun Foundation News Sheet 6.1.
16. Meganck V, Hoflack G & Opsomer G. (2014) Advances in prevention and therapy of neonatal dairy calf diarrhoea: a systematical review with emphasis on colostrum management and fluid therapy. Acta Veterinaria Scandinavica. 56, 75.
17. Berchtold J. (1999) Intravenous fluid therapy of calves. Veterinary Clinics of North America: Food Animal Practice. 15: 3.
18. Todd CG, Millman ST, McKnight DR, Duffield TF, Leslie KE: Nonsteroidal anti-inflammatory drug therapy for neonatal calf diarrhea complex: Effects on calf performance. J Anim Sci. 2010, 88: 2019-2028.
19. Baxter-Smith K & Simpson R. (2019) A comparison of antibody quantities in commercial calf scour pastes vs. colostrum from cows vaccinated with Rotavec® Corona. BCVA.
20. Cox C. (1987) The open air factor. The Aerobiological Pathway of Microorganisms. pp. 218-229. Chichester: John Wiley.

Bovilis® Rotavec® Corona contains inactivated rotavirus, coronavirus and *E. coli* strain CN7985, serotype O101:K99:F41. **POM-VPS**. Bovilis Cryptium® contains inactivated *Cryptosporidium parvum* Gp40. **POM-V**. Bovilis® Bovivac® S contains inactivated cells of *Salmonella Dublin*, strain S342/70 and *Salmonella Typhimurium*, strain S341/70. **POM-V**. Halocur® contains 0.5mg/ml halofuginone lactate in an aqueous excipient. **POM-V**. Vecoxan® contains 2.5mg/ml diclazuril. **POM-VPS**.
Further information is available from the respective SPC, datasheet or package leaflets.
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