Healthy calves: future of your herd

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Rearing healthy calves is fundamental to a successful dairying enterprise. Heifer calves represent the future of the herd and high mortality rates are detrimental to herd progress, both in terms of any planned expansion and genetic gain. Neonatal calf diarrhoea is the most common cause of mortality in calves, with calf pneumonia also a serious cause of both morbidity and mortality. Both can be prevented and treated successfully if appropriate measures are implemented.

Neonatal calf scour
Scour in calves results from inconsistent feeding regimes or an infection. Infectious causes of scour are most common and Table 1 outlines common causes and when clinical signs are most likely to occur.

The most important ways to prevent scour outbreaks are:

a) Ensuring an adequate volume (three litres) of good-quality colostrum is fed within two hours of birth. Aim for approximately 8.5% of birth body weight, i.e. three litres for a 55kg calf. Use only the first milk from the freshly calved cow – subsequent milkings (transition milk) do not contain enough antibodies to develop the calf’s immune system adequately and, as a result, the calf cannot fight off infection.

b) Optimising daily feed requirements post-colostrum and transition milk feeding are approximately 15% of calf body weight, i.e. six litres/day for a 40kg calf; below this will lead to reduced growth rates and increased susceptibility to disease.

c) Practicing excellent hygiene of calf pens and feeding utensils. Keep calf pens clean and freshly top up with dry bedding. A damp, cold calf will be more susceptible to infectious pathogens in the environment. Feed buckets must be kept clean in order to prevent build-up of bacteria.

Treatment of calf scour
Treatment of neonatal calf scour will involve rehydration, correction of acidosis, and replacement of electrolytes (sodium (Na+), Potassium (K+), and Chloride (Cl-)). Initial treatment of diarrhoea using electrolyte solutions is predominantly carried out by farm personnel, often with little regard for the quality of the formulation or its acid buffering capacity. Correction of the metabolic acidosis that accompanies episodes of diarrhoea is essential in achieving calf recovery. Some products, while assisting with rehydration and replacement of electrolytes, often fail to effectively correct acidosis, which is essential to recovery of the calf.

Products meeting these requirements will state that they are fit for the “stabilisation of water and electrolyte balance to support the physiological digestion”. Products not conforming will state that they are “complementary feeds” only. Therefore, it is important for dairy farmers to ensure that a product is...
appropriate to their requirements, i.e. that it will treat a calf with scour.

**Neonatal calf pneumonia**

Many of the underlying contributors to calf scour, such as poor hygiene and inadequate colostrum intake, are also implicated in outbreaks of calf pneumonia.

Additionally, inadequate housing with poor or excessive ventilation leads to increased susceptibility of dairy calves to pneumonic pathogens. Good husbandry will greatly assist in preventing outbreaks and housing/management inadequacies should be corrected prior to taking any further preventative action.

Calf pneumonia is a highly complex and multifaceted condition, so much so that in veterinary circles, it is referred to as calf pneumonia complex. Often, multiple viral and bacterial pathogens are involved, which leads to a worsening of the condition. Causative pathogens of calf pneumonia complex are included in Table 2.

Prevention of calf pneumonia is greatly assisted by ensuring you have high-quality calf housing. Good ventilation must be provided and this can be judged by the odour level in housing.

Very strong odours often indicate a build-up of ammonia (from urine) in the calf’s environment. Ammonia will damage the protective mechanisms in the calf’s windpipe, which

| Table 1: Common causes of calf scour on Irish dairy farms with approximate times of occurrence |
|---------------------------------------------|--------------------------------------|---------------------------------|
| **Cause of calf scour** | **Age clinical signs commonly appear** |
| Cryptosporidium parvum | First week of life |
| Escherichia coli | First week of life |
| Rotavirus | 1 to 3 weeks of age |
| Coronavirus | 1 to 3 weeks of age |
| Salmonella species | 2 to 6 weeks of age |
| Coccidia | 3 to 6 weeks of age |

**Table 2: Pathogens of calf pneumonia complex**

<table>
<thead>
<tr>
<th>Causative agent</th>
<th>Type of pathogen</th>
<th>Likely contributor</th>
<th>Vaccine available*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovine respiratory syncytial virus (BRSV)</td>
<td>Virus</td>
<td>Very likely</td>
<td>Yes</td>
</tr>
<tr>
<td>Parainfluenza 3 (PI3)</td>
<td>Virus</td>
<td>Very likely</td>
<td>Yes</td>
</tr>
<tr>
<td>Coronavirus</td>
<td>Virus</td>
<td>Likely</td>
<td>Yes</td>
</tr>
<tr>
<td>Bovine viral diarrhoea virus (BVD)</td>
<td>Virus</td>
<td>Unlikely**</td>
<td>Yes</td>
</tr>
<tr>
<td>Bovine herpesvirus-1 (IBR)</td>
<td>Virus</td>
<td>Likely</td>
<td>Yes</td>
</tr>
<tr>
<td>Pasteurella multocida</td>
<td>Bacterium</td>
<td>Very likely</td>
<td>Yes</td>
</tr>
<tr>
<td>Mannheimia haemolytica</td>
<td>Bacterium</td>
<td>Likely</td>
<td>Yes</td>
</tr>
<tr>
<td>Mycoplasma bovis</td>
<td>Bacterium</td>
<td>Likely</td>
<td>No</td>
</tr>
<tr>
<td>Haemophilus somnus</td>
<td>Bacterium</td>
<td>Unlikely</td>
<td>No</td>
</tr>
</tbody>
</table>

* Based on Irish licensing by the HPRA (www.HPRA.ie)
**Due to implementation of the Irish national BVD eradication scheme

prevent the infectious pathogens listed in Table 2 from reaching the lungs. However, achieving good ventilation is a balance and calves should not be held in a draughty environment. Provision of a deep straw bed and partial pen-roofing to prevent down-draughts will ensure calves can employ avoidance mechanisms to keep themselves warm and dry, essential elements in decreasing the susceptibility of calves to pneumonia.

Probably, more so than calf scour, good biosecurity plays an important role in the prevention of calf pneumonia. A closed herd policy will help reduce the risk of disease introduction to the herd as a whole, particularly in preventing viral introduction. Vaccines have a very important role to play in preventing and controlling calf pneumonia complex. These vaccines boost the immunity provided to the calf from colostrum and ensure protection should the colostrum provided not contain the required protective antibodies.

**Treatment of calf pneumonia**

If a case of calf pneumonia is suspected, the calf should be immediately isolated in a warm and dry environment. Calf pneumonia will always require veterinary intervention and the sooner the intervention takes place, the better the prognosis for both the sick calf and the remainder of the calf group.

Pneumonia resulting from viral infections will not be improved by antibiotics. However, it is often prudent to administer antibiotics as secondary bacterial pneumonias often follow an initial viral infection. These secondary infections are more severe and the prognosis in such cases is poorer.

Finally, it should be remembered that pneumonia is a painful condition. Calves in pain will reduce their feed intake, which will contribute to a worsening of the overall condition. Therefore, pain relief (e.g. an anti-inflammatory) should always be administered with antibiotic treatment.

If feed intake is reduced during the pneumonic episode, an electrolyte supplement will be required. Unlike calf scour, a formulation which corrects acidosis is not required in this case and correction of dehydration is most important.

If it is necessary to assist the calf with feeding, it is essential to remember that these calves may have difficulty swallowing, which may lead to milk/fluids entering the lungs, again detrimental to the calf’s condition. If required, feed sick calves slowly and carefully to avoid/minimise aspiration of fluids into the lungs.

**CONCLUSION**

Good calf husbandry (clean, warm, dry, ventilation, vaccination) will go a long way in preventing serious outbreaks of calf scour and pneumonia. If treatment is required, ensure appropriate products are administered and try to maintain feed intake throughout the period of illness if possible.
## Assessing Scouring Calves

<table>
<thead>
<tr>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
<td><img src="image5" alt="Image" /></td>
<td></td>
</tr>
</tbody>
</table>

### Demeanour
- **Score 0**: Bright, alert, responsive
- **Score 1**: Dull, possibly depressed, less responsive
- **Score 2**: Dull, depressed, less responsive
- **Score 3**: Dull, markedly depressed, markedly unresponsive
- **Score 4**: Unresponsive to any stimulation

### Ears
- **Score 0**: Alert and mobile
- **Score 1**: Slightly drooped
- **Score 2**: Drooped
- **Score 3**: Drooped and limp
- **Score 4**: Drooped and limp

### Mobility
- **Score 0**: Actively mobile and able to stand without assistance or intensive encouragement
- **Score 1**: Capable of standing and walking independently with a little encouragement
- **Score 2**: Capable of standing and walking independently but encouragement required
- **Score 3**: Capable of standing with assistance but unable to walk
- **Score 4**: Recumbent

### Interest in surroundings
- **Score 0**: Interactive when approached
- **Score 1**: Interactive when approached
- **Score 2**: Uninterested when approached
- **Score 3**: Uninterested when approached
- **Score 4**: Uninterested when approached

### Suck Reflex
- **Score 0**: Good suck reflex
- **Score 1**: Diminished suck reflex
- **Score 2**: Markedly diminished suck reflex
- **Score 3**: No suck reflex
- **Score 4**: No suck reflex

### Feed intake
- **Score 0**: Feeding well
- **Score 1**: Slow to drink and may not finish what is offered
- **Score 2**: Reduction in feed intake (not finishing what is offered)
- **Score 3**: No feed intake (not taking any of what is offered)
- **Score 4**: No feed intake (not taking any of what is offered)

### Dehydration
- **Score 0**: Clear bright eyes
- **Score 1**: Eyes slightly sunken
- **Score 2**: Eyes sunken
- **Score 3**: Eyes markedly sunken
- **Score 4**: Eyes markedly sunken

### Action
- **Score 0**: None
- **Score 1**: Isolate for monitoring and treatment
- **Score 2**: Monitor hydration status
- **Score 3**: Isolate for monitoring and treatment
- **Score 4**: Isolate for monitoring and treatment

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Veterinary assistance required