Approaches to calf pneumonia

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OLIVER TILLING BVSc, BSc, MRCVS reviews the true financial cost of calf pneumonia before discussing which animals should be treated and how for optimum herd health results

“WE’VE got a bug – we want a drug.” A telephoned request all farm practitioners will be familiar with when it comes to calf pneumonia.

While the temptation is to prescribe whichever antibiotic and NSAID are on the shelf and forget about the issue, a more detailed conversation and, ideally, a farm visit are required.

However, ultimately, calves with pneumonia require treating and this article will focus on this area.

Incidence and cost

Twenty-one per cent of all disease in pre-weaned calves is due to pneumonia, and 22.5 per cent of all pre-weaning calf deaths are attributed to it. Of post-weaning deaths, 46.5 per cent are due to pneumonia (NAHMS, 2007). Calf pneumonia has major impacts on the economic performance of cattle operations. This is due to direct costs of morbidity, mortality and treatment, as well as long-term effects on performance.

A single case of pneumonia carries a mean cost of £43.26 per sick dairy calf, and a mean cost of £29.58 per calf for the rest of the group (Andrews, 2000). Add the cost of a two-week delay to first service (Van der Fels- Klerx et al, 2002), at £1.65/ day (Esslemont et al, 1998), plus a 2.2 per cent reduction in first lactation milk yield equalling 132 litres (first lactation of 6,000 litres; Van der Fels-Klerx et al, 2002) with a current milk price of 33.66ppl (DairyCo, March 2014 price) and the cost of

a single case of pneumonia rises to £110.79.

Costs in suckler calves are £82.10 per sick calf, and £74.10 per calf for the rest of the group (Andrews, 2000). These estimates do not include a value for the welfare costs endured by the calves, nor the emotional cost to the stockman and others in the industry (Robertson, 2000).

Who do we treat?

All practitioners and most farmers are aware of the obvious clinical signs of calf pneumonia – some or all of:

- depression;
- anorexia;
- nasal discharge;
- ocular discharge;
- cough;
- abnormal ear position;
- increased respiratory rate;
- increased respiratory noise on chest auscultation; and
- pyrexia.

How do we decide which animals in a group showing signs we should treat? “Temp and treat” is very useful in the decision-making process. Providing adequate handling facilities are available, all animals with a temperature greater than 39.5°C should receive treatment.

This may well be adequate in many systems, but in the author’s practice a scoring system for calf pneumonia is commonly used.

The McGuirk calf health scoring chart developed at the University of Wisconsin, Madison, provides a calf’s respiratory score by adding scores from each of rectal temperature, cough, nasal discharge and the highest score from either ocular discharge or ear position. Animals scoring four are marked (either individually or their pen) and designated “watch”, while those scoring five or above are treated.

Used on a regular basis (ideally twice a week) by the farmer, it allows early recognition and treatment of sick calves. For many farms, though, this does not work and “temp and treat” is more appropriate, especially in the middle of an outbreak.

In many outbreaks of calf pneumonia the morbidity rate is high and, on welfare grounds, it is advisable to treat all the calves in the group if multiple calves are affected (Gibbs, 2001).

The use of antimicrobials for prevention (prophylaxis or metaphylaxis) of calf pneumonia has to be

seen in the context of increasing pressure on the veterinary profession to promote prudent use of antibiotics, noting that their indiscriminate use promotes the selection and subsequent proliferation of antibiotic resistant strains of bacteria (Lorenz et al, 2011).

At what point do we initiate metaphylaxis? The author advises clients to treat all animals in a group if more than 10 per cent are showing signs of pneumonia – assessed either by “temp and treat” or the McGuirk calf health scoring chart (whichever the farm employs). The justification is that both clinical and subclinical infections receive treatment; it reduces environmental contamination with potentially pathogenic bacteria, and reduces handling of sick stressed animals, which might otherwise exacerbate symptoms. In addition, it is likely overall antibiotic usage will be reduced with fewer repeat treatments.

It should be remembered the aim of metaphylactic treatment is slightly different from the therapy of clinical cases. In metaphylaxis, the aim is to prevent or delay the proliferation of bacterial pathogens and the associated horizontal transmission between animals in the group, as well as preventing any lower respiratory tract infection, thus the intended site of action is not just in the lungs (Potter, 2009).

When do we treat?

The single most important factor determining the success of therapy in calves with pneumonia is early onset of treatment and subsequent adequate duration of treatment (Lorenz et al, 2011). Treatment must be instigated as early in the disease as possible to reduce the possibility of long-term pulmonary damage and the development of chronic pneumonia (Gibbs, 2001).

Using the above guidelines about what animal to treat we must emphasise to clients that once an animal shows these signs, treatment must be immediate – never wait and see.

Veterinary attendance from first recognition of respiratory disease guarantees immediate attention of those calves that suffer the most severe clinical signs, and ensures responsible use of antibiotics and observation of withdrawal periods, thus ensuring food safety and consumer confidence in the cattle industry (Scott, 2010). Educating clients on the importance of early veterinary involvement in any disease outbreak is essential in modern farm veterinary practice.

What do we treat with?

The specific treatment of calf pneumonia should form part of any farm’s herd health plan. Our main aim is to cure affected animals. Treatment should be aimed at eradicating the pathogen and any associated inflammatory or hypersensitivity reaction and aiding in the control of pyrexia and depression (Gibbs, 2001).

Table 1 (see PDF) lists the main pathogens involved in calf pneumonia, but is not exhaustive. While

viruses and mycoplasma can be viewed as primary pathogens and bacteria secondary invaders, disease does not always follow that pattern. There are no antiviral drugs available for use in calves and, therefore, the main component of treatment for calf pneumonia is with antibiotics.

More antibiotics are available for the treatment of calf pneumonia than any other condition in calves, so choice relies on a number of factors. These include the vet's previous experience on the affected farm and elsewhere, reported susceptibility patterns, practical considerations such as cost, ease and frequency of use, on-farm handling facilities and, for some products, the issue of human safety.

In addition to antibiotics, NSAIDs should be used in the calf with pneumonia. These drugs have several beneficial actions. The anti-inflammatory component reduces lung damage and allows improved penetration of lung tissue by the antibiotic. They are analgesic – pneumonia is a painful condition – and anti-pyretic, which combined will improve calf demeanour and stimulate feed intake, which will in turn further improve recovery. Their anti-endotoxic actions are of benefit against Gram-negative infections.

Sick pre-weaned calves may stop feeding so the author advocates the use of oral rehydration therapy (ORT) in these cases: four feeds a day, six hours apart, alternating two litres milk and two litres ORT. An oesophageal feeder is used if the calf will not drink on its own. This is continued until the calf has improved or for a maximum of three days, when the farmer is advised to seek further veterinary advice.

All animals that receive treatment should be recorded with the date, calf I/D, treatment and amounts administered. This should be done as a matter of course for farm assurance purposes. Ideally, it should also be displayed near where calves are housed. This allows all those dealing with calves to know who has received treatment and monitor progress.

If possible, sick calves should be isolated either on their own or in groups of sick animals in a separate air space away from other calves. These "hospital pens" should reduce the risk of spread of infection to other healthy animals. It also allows closer monitoring of sick calves – assessment of response to treatment, feed and water intake and additional treatment can be easily administered if required. In practice, isolation is not always possible and, when a whole group of calves is being treated, not necessary.

Although treatment regimes are often implemented prior to definitive diagnosis of the causative agent, it is important to carry out diagnostics to refine treatment and develop long-term management strategies for the control of respiratory disease on farm. Samples should be taken from typical cases in the early stages of an outbreak (Potter, 2007).

Where there are mortalities, postmortem examination of previously untreated individuals should provide the necessary diagnostic material for identification of causal organisms.

In live animals, bronchoalveolar lavage is often quoted as the gold standard for collecting samples from the lower respiratory tract; however, the equipment for the procedure is not available for purchase in the UK. Nasopharyngeal swabs allow bacterial and virus isolation. Ocular swabs can be used if infectious bovine rhinotracheitis (IBR) is suspected. Paired serology – one sample taken at the beginning of an outbreak, the other 14 to 21 days later – looks for serological conversion. When paired serology is not possible or if calf pneumonia has been present on a farm for some time, then a single serum sample from four to six-month-old animals provides retrospective evidence as to which viruses or mycoplasma have been circulating. When faced with an outbreak the clinician should sample six untreated animals.

The treatment of calf pneumonia forms only part of a package of measures that should be deployed when a farm client contacts the vet for assistance. It is, of course, a very important part. Ensuring the right animals are treated as soon as possible in the disease process, with the correct antibiotics and other ancillary therapies, should reduce morbidity and mortality while maximising health and welfare of calves, and thus increase overall farm performance and productivity.

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