Controlling Pasteurella Pneumonia in Sheep

Introduction
Pneumonia is extremely common in sheep and can be responsible for enormous financial losses both here in the UK and worldwide. The condition usually appears when sheep are exposed to combinations of predisposing factors such as adverse physical conditions, physiological stress, bacterial and viral infections. As the exact nature of these combinations is unknown much remains to be understood about why the disease occurs in the way it does.

However we do know what type of infections cause pneumonia in sheep:

- **Bacterial infections** - Pasteurellosis (*Mannheimia haemolytica*)
- **Mycoplasma infections** - Mycoplasmosis
- **Viral Infections** - Maedi Visna
- **Mycoplasmosis**
- *Ovine Pulmonary Adenocarcinoma (OPA or jaagsiekte)*
- *Parainfluenza type 3 (PI3) virus*
- *Adenoviruses*
- Respiratory syncytial virus (RSV)
- **Parasitic infections** - Lungworm

Knowing which infection is causing the pneumonia will help farmers and their vets control.

Pneumonic Pasteurellosis
The most common type of pneumonia in sheep is by the bacterium *M. haemolytica*. As this is frequently found in association with almost all of the other agents mentioned above, controlling pasteurellosis can go a long way to ensuring that you reduce the incidence of pneumonia in your sheep flock. Most outbreaks of pneumonic pasteurellosis occur in May, June and July and many involve both ewes and lambs. Flock outbreaks usually start suddenly with deaths, often in young lambs in which the disease is hyperacute and septicaemic rather than pneumonic. As lambs get older the disease is more often seen as pneumonia although sudden deaths with septicaemia rather than pneumonia may still occur.

In the first few days of an outbreak a number of sheep will show clinical signs of pneumonia. Closer inspection of the flock will show that some sheep have an occasional cough and slight eye and nasal discharges. Morbidity and mortality vary but up to 10% of the flock may be affected. Pneumonic pasteurellosis also occurs in individual sheep sporadically rather than as part of a clearly defined flock outbreak.

Predisposing Factors
It is generally assumed that environmental factors are important predisposing causes of pneumonic pasteurellosis; some outbreaks can be linked to previous stressful situations such as warm or cold, wet weather and dipping, castration or dosing. In general any extremes or rapid changes in climatic conditions are often associated with outbreaks of pneumonia. There is also evidence that infection with parainfluenza virus type 3 (PI3), respiratory syncytial virus (RSV) and sheep pulmonary adenocarcinoma (OPA) are factors that can predispose sheep to pneumonic pasteurellosis.

Infection with PI3 virus generally produces a mild respiratory illness. Viral infection destroys host cells and damages lung tissues and this is thought to create an ideal micro-environment in the lung which will favour *M. haemolytica* growth. This superimposed infection of the lungs with *M. haemolytica* strains is the cause of pneumonia. In most cases flock outbreaks on individual farms are sporadic and do not occur every year although on some farms small numbers of sheep may succumb annually.
Some other bacterial infections also increase the susceptibility of sheep to secondary infections. Mycoplasma spp. are common in the respiratory tract of sheep and combined infection with *Mycoplasma ovipneumonia* and *M. haemolytica* induces chronic “atypical” pneumonia in lambs.

**Treating Pasteurellosis**
Managing your flock to reduce all the trigger factors is crucial to the prevention and control of pasteurellosis. As *M. haemolytica* is often found in the upper respiratory tract of apparently healthy animals, eradicating the organism is not an option and biosecurity will be limited in preventing its spread. If pasteurellosis does occur it can be treated with long acting antibiotics. Treatment of all the lambs in a flock as soon as possible after the start of an outbreak can prevent a significant number of further cases and be economically justified but usually still results in some stunted lambs.

**Protecting your flock from Pasteurellosis**
Prevention of disease is best achieved by the use of specific Pasteurella vaccines (there are no vaccines available for the other agents of sheep pneumonia). Remember that to make the most effective use of any vaccine it must be used in the correct way, at the right time. Circumstances and systems of management vary from farm to farm and you should consult your veterinary surgeon about a suitable programme for your flock.

<table>
<thead>
<tr>
<th>Type of stock</th>
<th>Product</th>
<th>number of doses</th>
<th>when to vaccinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambs</td>
<td>combined pasteurella and clostridial vaccine</td>
<td>2 doses 4-6 weeks apart</td>
<td>from 3 weeks of age</td>
</tr>
<tr>
<td>Lambs at high risk of pasteurellosis*</td>
<td>pasteurella vaccine</td>
<td>2 doses 4-6 weeks apart</td>
<td>from 2 weeks of age or 2 weeks before period of stress</td>
</tr>
<tr>
<td>Bought in breeding replacements and lambs kept as replacements</td>
<td>combined pasteurella and clostridial vaccine</td>
<td>2 doses 4-6 weeks apart</td>
<td>2-3 months before tupping</td>
</tr>
<tr>
<td>then</td>
<td></td>
<td>1 dose</td>
<td>4-6 weeks before lambing</td>
</tr>
<tr>
<td>then</td>
<td></td>
<td>1 dose</td>
<td>4-6 weeks before subsequent lambings</td>
</tr>
<tr>
<td>ewes at high risk of pasteurellosis*</td>
<td>pasteurella vaccine</td>
<td>1 dose</td>
<td>before tupping or 2 weeks before period of stress</td>
</tr>
</tbody>
</table>

*Discuss with your own vet whether your stock is considered to be at high risk of pasteurellosis. In extreme cases, three pasteurella vaccinations may be required; one pretupping, one mid pregnancy and one at weaning.*

Table 1 above shows a programme of vaccination using combined clostridial and Pasteurella vaccines which can be used to give cover against these two groups of diseases. It is of course possible to use separate clostridial and Pasteurella vaccines at the same time but it would be wise to give them at separate sites e.g. on the opposite sides of the sheep. The table is intended to be used as a guide only. Please talk to your own vet about an appropriate vaccination programme on your own farm.

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