

Bulgarian symposium focuses on antimicrobial resistance on the farm

Antibiotics are one of the most important therapeutic discoveries in medical history. They have contributed to reducing mortality and morbidity from bacterial disease in mankind, livestock and pets. Today, although antibiotic resistance is not a new phenomenon, there is international concern around the rise in drug resistant infections and public recommendations to restrain the use of antibiotics.

Correct use on the farm

The answer to preserve these important therapeutics is not to simply reduce the volumes used. It is about implementing their judicious, responsible and correct use in daily veterinary routines on the farm. Combating resistance requires a 'One Health' approach integrating, amongst others, animal health, public health, food, and the environment.

These were the opening words on the programme for the symposium entitled Aim Before You Shoot, which was recently hosted by Huvepharma in Bulgaria.

One of the practical papers was entitled Antimicrobial treatment of bovine respiratory diseases and was presented by Irish veterinarian Michael Sexton. He comes from a 13 veterinarian group that has a 50% cattle base, of which 95% (approximately 300 herds) is dairy. Ireland has more cattle than people (6.42

vs. 4.75 million). There are some 17,000 dairy herds which is a marked reduction from the 144,000 that there were in 1975.

A typical Irish dairy farm has 70 cows which calve between January and April. Typically, most cease milk production in November and are housed from November to March, therefore their milk production comes from grass.

The common disease syndromes seen by Michael are shown in Table 1 and their aetiologies involve RSV, PI3, IBR and BVD (all viruses), the nematode parasite *Dictyocaulus viviparus* and various bacterial infections (often secondary infections).

Common bacterial isolates include *Mannheimia haemolytica*, *Pasteurella haemolytica* and *Mycoplasma bovis*.

Laboratory based diagnostic tools are infrequently used for the following reasons:

- Most infections are mixed viral and bacterial ones.
- Most decisions for drug choice are experience based.
- Most post mortems show pasteurellosis, which is seldom the primary cause.
- Swabs may not detect all the viruses present.

Antibiotic choice takes into account the duration of the treatment and the route of administration. Antibiotic treatments fall into three categories:

- One off administrations. These include certain macrolide and some tetracyclines.
- Periodic repeated doses, such as florfenicol.
- Daily treatments, including tetracyclines, quinolones and amoxicillins.

Then there are the critically important antibiotics, which are associated with resistance problems in man and should not be used.

These include the fluoroquinolones, the third and fourth generation cephalosporins and colistin.

When it comes to supportive therapies the main drugs used are anti-inflammatories, such as NSAIDs and steroid based products.



Where hoose is a factor an appropriate wormer is used. Also used are diuretics, mucolytics and bronchodilators.

Michael feels that it is important to have a treatment strategy for farms. This should centre around:

- Isolation of sick animals.
- Elimination of chronic non-responders.
- Having a policy for purchased animals.
 - Quarantine where possible.
 - Administration of a long acting antibiotic.
 - Administration of an anthelmintic.
 - Vaccination.

When it comes to treating animals he is strongly against treating the whole group but prefers a prevention approach that focuses on the following:

- Good prevention strategies.
- Good stockmanship.
- Smaller groups.
- Good housing.
 - Good air quality and circulation.
 - No chilling draughts.
 - Correct environmental temperature.
 - Correct stocking density.
 - Dry bedding.
 - Correct roof height.
- Vaccination.

However, he would treat the remainder of the group when:

- Other animals show clinical signs.
- The initial clinical case is severe.
- If the condition is acute/chronic.
- If there is a high animal density.
- In situations where management is deficient.

Preventing disease is all about prevention management and key points here are:

- Adequate housing.
- Not turning calves out too early.
- Appropriate anthelmintic use at grass.
- Correct weaning strategy.
- Correct timing of housing.
- Management of purchased stock.
- Good biosecurity practices.

The disease prevention or prophylaxis part of this is important and centres around:

- A neonatal calf vaccination programme.
- A re-weaning/pre-housing vaccination programme.
- Vaccination for IBR.
- Anthelmintics for primiparous cows, calves and weanlings.
- Very selective use of antibiotics

As far as the future is concerned he sees the following trends emerging:

- Earlier detection with automatic feeders.
- More neglect on bigger units.
- Some good drug developments over the next 15 years.
- Better housing is the single most important factor.
- Better use of vaccination programmes – problems with neonatal BRD.

Ireland now has a National Action Plan on Antimicrobial Resistance for 2017-2020.

To help achieve the targets set, there is a need to focus on antimicrobial resistance and a need to

Continued on page 32

Table 1. Common disease syndromes seen in Irish dairy cattle.

Disease	Typically occurs
Calf pneumonia	April
Hoese (husk)	July – September
Housing pneumonia	October – November
Primiparous cows	June
Coughing cow	August onwards

Continued from page 31

reduce it. This focuses on the correct use of antimicrobials by all parties, including:

- Avoiding under dosing.
- Always administering by the correct route.
- Using for correct treatment times.
- Reviewing the wisdom of retreating non-responders.
- Controlling off label and unlicensed uses.

In a five year plan is a world without antibiotics a reasonable goal? Probably not, but we can go a long way towards it with better control of Johne's disease, better use of anthelmintics, better housing, better vaccination and a more prudent use of antibiotics.

Neonatal enteritis

A presentation entitled Anti-microbial treatment of neonatal enteritis in calves was given by Dr Ingrid Lorenz from the Bavarian Animal Health Service.

Ingrid considers neonatal gastro-enteritis to be a multifactorial disease in which the calf interacts with its environment, its nutrition and viruses, bacteria and protozoa and is a major cause of mortality in young cattle under six months old.

Timothy Walsh from the University of Cardiff reflected on the global spread of antibiotic resistance. He gave some interesting observations:

- If antimicrobial resistance is not tackled soon, by 2050 the human death rate could be one death every three seconds. That is, in 2050 there will be 10 million such deaths compared to 700,000 today.
- Meropenem, a carbapenem antibiotic which is used to treat multi-drug resistant infections in man, can be bought online without prescription.
- A comprehensive resistome analysis published in 2016 revealed a high prevalence of multi-drug resistant *E. coli* carrying the MCR-1 gene in Chinese poultry production.
- We should not underestimate the role of wildlife/wild birds in the global transmission of antimicrobial resistance genes.
- Animals in the USA consume 70% of medically important antibiotics for man.
- A major contributor to antimicrobial resistance is poor governance and corruption.

Its causes include enterotoxigenic *E. coli*, which produce various toxins, various viruses, some of which can destroy epithelial cells lining the gut and substances that act like enterotoxins, the parasite cryptosporidium, which damages enteric villi causing malabsorption and ultimately resulting in severe diarrhoea and dehydration.

When it comes to treatments Ingrid stressed the importance of the following:

- The replacement of fluids by using electrolytes and buffers.

- Oral electrolytes should only be used when calves are still drinking and <8% dehydrated.
- Intravenous fluid therapy.
- Continuous milk feeding.
- Use of anti-inflammatories, such as NSAIDs.

When it comes to using antibiotics she highlighted that sick calves with diarrhoea have an increased risk of developing *E. coli* bacteraemia or septicaemia and that calves with enteritis due to salmonella can be assumed to be

bacteraemic. Therefore treatment should be aimed against Gram negative bacteria in the blood and the small intestines and such treatment should preferably be parenteral.

Two further points were that faecal bacterial cultures and AMR susceptibility testing is not a useful exercise in calves with neonatal diarrhoea and in cases/outbreaks of diarrhoea due to salmonella, treatment should be based on susceptibility testing results.

The first choice antibiotics for ill calves with diarrhoea, where it is thought that infection has spread into the body, are ampicillin, amoxicillin or a potentiated sulphonamide.

Fluoroquinolones and third or fourth generation cephalosporins should not be used and, if they are, they should only be used under veterinary direction. If there is no evidence of systemic illness the calf should not receive antibiotics and they should be monitored.

Prevention is always better than cure and this can be centred on vaccination of the mothers and the possible use of halfuginone.

Finally, remember the 1-2-3 of colostrum – use colostrum from the 1st milking for the 1st feed and give it within 2 hours of birth ensuring that each calf gets at least 3 litres of colostrum. ■