

A Case of Mycoplasma Resistance ??

Alan Pearson MRCVS
Independent Veterinary Consultant

Outline of the paper

- Mycoplasma – what is it
- Which one are we talking about & what does it do
- A number of cases in the UK which appeared antibiotic resistant
- Action on farm in the UK
- Central Action in the UK
- Is this Achievable in the US
- Questions

What is Mycoplasma

- ▶ Online Encyclopaedia defines it as
- ▶ *Mycoplasma* is a genus of bacteria that lack a cell wall around their cell membrane
- ▶ Without a cell wall, they are unaffected by many common antibiotics such as penicillin or other antibiotics of that type that target cell wall synthesis
- ▶ They can live in reduced oxygen atmospheres
- ▶ They are the smallest bacteria yet recognised
- ▶ They are difficult to grow and handle in normal laboratories
- ▶ They can slip through some bacterial filters and become lab contaminants

Which one ?

- ▶ There are over 100 recognized species of Mycoplasma
- ▶ They affect humans , animals, birds and even insects
- ▶ The common ones [in the UK] in order of cases seen are
 - Mycoplasma gallisepticum Mg
 - Mycoplasma synoviae Ms
 - Mycoplasma meleagridis Mm [turkeys
- In this paper we will discuss a strain of Mg which caused some issue in the UK in the summer of 2014

The disease

Part of an article I produced for a UK Game magazine

‘In itself, the disease is quite mild and innocuous but it is triggered and exaggerated by a number of factors including: other diseases, dust, and moving house. For instance when combined with various other commonly present bacteria, the disease becomes Chronic Respiratory Disease, also known as CRD or ‘one-eyed cold’. Among gamekeepers, it is often known as ‘bulgy eye’. The actual symptoms can vary but may include a combination of any of the following’



Clinical Signs

- ▶ **Coughing**
 - ▶ **Discharge from the eyes and nose**
 - ▶ **Poor productivity**
 - ▶ **Slow growth**
 - ▶ **Leg problems**
 - ▶ **Stunted growth**
 - ▶ **Inappetance (birds that are off their food)**
 - ▶ **Reduced hatchability and chick viability**
- 



Mycoplasma in a Hen Bird >>

Commonly called bulgy eye

Transmission

- ▶ Mg can be transmitted from generation to generation in the egg.
 - ▶ It is transmitted directly by contact,
 - aerosols (such as coughs and sneezes),
 - In the mucous from a runny nose, in dust and on feathers.
 - ▶ It is also known that wild birds can carry the infection, too.
- 

A helping hand

- ▶ Mycoplasma is fairly innocuous on it's own
- ▶ Work done by Dr Janet Bradbury in the UK in the 70s and 80s indicated that the severity of the disease could be enhanced by the presence of other bacterial or viruses
- ▶ These include
 - Infectious Bronchitis [IB] and it's many variants
 - Infectious Laryngotracheitis [ILT]
 - Avian pneumovirus
- This will become significant when we look at diagnosis and control later

Cases of an Intransigent Mg

- ▶ Case 1
- ▶ Summer 2104
- ▶ 3 weeks old Pheasants showing signs of bulgy eye and lethargy
- ▶ Controlled environment warm and very dusty
- ▶ Classic signs of bulgy eye
- ▶ Mg diagnosed by physical signs
- ▶ Treatment initially 3 days Aivlosin at standard dose
- ▶ Poor response after 6 days decide to re-treat
- ▶ 2nd course at 1.5 times standard dose for 5 days
- ▶ Better response and birds were sent 'to grass'
- ▶ Had various subsequent courses of Doxycyclines which were for Motile protozoan conditions and odd birds continued to show bulgy eye

Case 1 cont'd

- ▶ In late summer some birds were selected for the following seasons breeding programme. It came to light at this time that the poults had been hatched from imported French eggs but the birds had inadvisedly been mixed with other groups
- ▶ In early Autumn clinical signs were seen of Mg seen again and treated 'in the field' initially with Aivlosin again and then finally with Tylan both in water and feed in view of the difficulties of administration in the wintering pens.
- ▶ Samples of whole heads had been submitted to Liverpool University for Mycoplasma isolation and Mg was confirmed but not typed.
- ▶ Specimens were transferred to Mycoplasma Experience for MIC testing
- ▶ Results were higher than expected for Aivlosin, Deneguard , and Pulmotil but lower for Tylan

Case 2

- ▶ French Chicks were imported to a Keeper in Cumbria in early June
- ▶ Signs of Mg were seen at about 3 weeks
- ▶ Initial diagnosis based again on classic clinical signs and basic bacteriology.
- ▶ Treatment commenced with Aivlosin [this was about 2 weeks after case 1]
- ▶ A second treatment was again required but in this case, based on experience, Tylan was used and the response was better but not complete and the keeper reported continued minor issues throughout the summer and a poorer than expected season result
- ▶ No additional ID or testing was undertaken for this client

Case 3

- ▶ Mg signs were seen in a local keepers birds in the release pens in late August
 - ▶ Birds were supplied from the Case 1 site but it was never confirmed whether they were from affected birds
 - ▶ No specific investigative work was done
 - ▶ Tylan was prescribed and a slow but reasonable response was achieved
- 

Summary

- ▶ 3 cases all loosely linked to an initial supply of imported chicks or eggs from France.
 - ▶ All responded poorly to the more modern antibiotics
 - ▶ Discussions with other Colleagues and Practices indicate several similar cases but not all were as traceable as these 3
 - ▶ More general discussion may indicate that this is not only a UK problem
- 



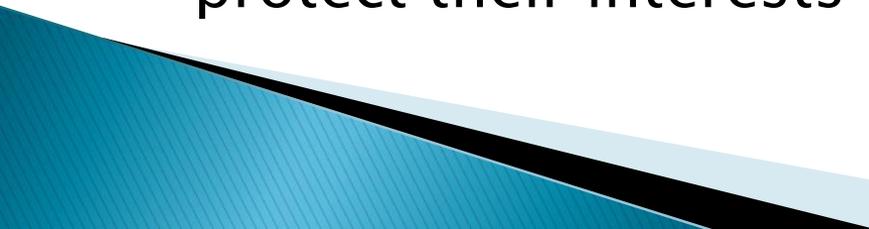
Action on farm in the UK

- ▶ Work with your Lab
 - Do isolations
 - Do Sensitivity testing
- The UK has several University and private Labs which now specialize in Mycoplasma

Action on farm in the UK

- ▶ Vaccination
- ▶ Mg vaccines
 - Live Vaccine – gives a quick response and primes the bird – usually given by eye drop
 - Dead vaccine [commercial] – oil based given by injection provides a long term depot and a drip feed effect to constantly remind the birds system
 - Autogenous vaccine – a dead vaccine made using the strain isolated on your unit
 - Vaccinate against other disease to prevent ‘Partnering’
 - Quarantine for incoming birds was undertaken

Central Action in the UK

- ▶ The UK is a small island with a very dense poultry population
 - ▶ The discovery of the alleged resistant strain caused concern because of the implication for the layer Industry
 - ▶ A Veterinary group has been formed as part of the British Poultry Vets which is sharing information and taking a scientific approach to looking at the strain
 - ▶ The group is also looking for research funding because the Game Industry is not rich
 - ▶ The layer Industry are possibly looking to help to protect their interests
- 

Is the same action achievable in the USA ?

- ▶ Mycoplasma Is notifiable in the US
 - ▶ Only the dead vaccine is available
 - ▶ Diagnosis has to be declared
- 

Is the same action achievable in the USA ?

- ▶ You could diagnose by default , tests can be done to eliminate other causes – this has advantages remember Dr Bradbury’s work on Mg and partner organisms
- ▶ You can treat a symptom without making the diagnosis and use the same antibiotic strategy as the UK –reviewing your application management
- ▶ You can prevent with dead vaccine [no priming with live vaccine is available]
- ▶ You can obviously quarantine incoming birds

Summary

- ▶ 2014 saw a potentially resistant strain in the UK possibly originating in France
 - ▶ Action was taken at farm level
 - ▶ Antibiotic usage and strategies were reviewed
 - ▶ Full diagnosis was undertaken
 - ▶ Autogenous vaccines were created and used
 - ▶ Sourcing of birds and quarantine was reviewed
 - ▶ Nationally an Action Committee was formed
- 



Thank- you
Questions