



# poultry focus

business news for the poultry industry

**Is *Mycoplasma gallisepticum* a primary disease agent in layer chickens? This month, we ask two well known experts, Dr Janet Bradbury from Liverpool University and David Parsons MRCVS for their views on the epidemiological and diagnostic aspects in commercial layers and game birds.**

**With Nobilis® MG 6/85 vaccine now available in the UK, we review the specialised spray cart designed and now in use in Spain and appropriate sprayers that can be used on a smaller scale.**

## *Mycoplasma gallisepticum* infections in Poultry

Dr. Janet Bradbury, Reader in Veterinary Microbiology, University of Liverpool



Mycoplasmas are the smallest of all the known free-living bacteria and can cause great concern to the poultry industry due to economic loss and disease. These simple-looking bacteria

have evolved relatively quickly and now possess only a minimal set of genes, but they put these few genes to excellent use in terms of their own survival. Despite successful eradication programmes by the primary chicken and turkey breeders, mycoplasma infections still occur in commercial poultry stock and can cause significant problems.

*Mycoplasma gallisepticum* (Mg) is the most important and can infect chickens, turkeys and game birds. It occurs in all countries where poultry are kept and the losses associated with the infection have been recognised for many years. As well as obvious respiratory disease Mg can cause reduced feed conversion efficiency, downgrading of broilers or turkeys at the slaughterhouse and a drop in egg production in layers. Valuable breeding flocks are usually culled if they become infected with Mg, and export restrictions on eggs or progeny may be imposed.

### Predisposing factors

In chickens Mg may not cause obvious signs of disease unless the birds are stressed for example by respiratory viruses such as Infectious Bronchitis or Newcastle Disease. The interaction between Mg and pathogenic strains of *E. coli* is also well known. Other stresses include overcrowding or excess ammonia in the poultry house.

Infection of broilers with *M. gallisepticum* and *E. coli* (Al-Ankari and Bradbury, unpublished)

Figure 1. Mortality

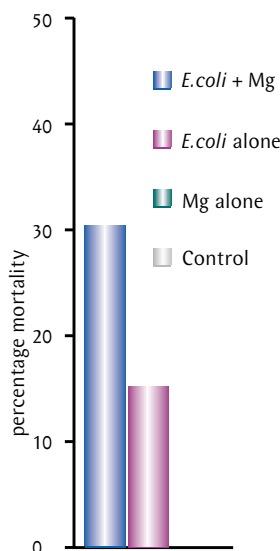
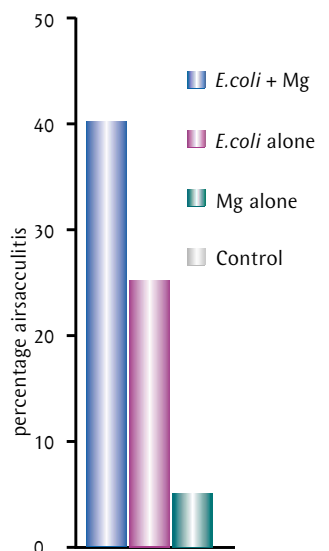


Figure 2. A airsacculitis



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## Clinical signs:

The mildest disease appears as a slight 'snick' but may develop into more obvious respiratory disease including sneezing and breathing through the partly opened beak. The eyes may also be affected with mild conjunctivitis and a frothy discharge. Sinusitis sometimes occurs, especially in turkeys and game birds. In the laying chicken Mg infection has been reported to cause a drop in egg production. Losses of up to 20% have been reported in table egg layers although mixed infections may also have been present in some cases. Mg can gain access to the reproductive tract, possibly by direct invasion from adjacent infected air sacs.

## Disease transmission

Pathogenic poultry mycoplasmae are passed from the parent to the offspring through the egg; vertical transmission. Methods of control have therefore involved treatment of hatching eggs with antibiotics or heat. Although such treatments are not necessarily 100% effective, they did underpin eradication schemes used some years ago by the primary chicken and turkey breeding companies. Horizontal spread from bird-to-bird and from flock-to-flock is also recognised. The simple genetic makeup of mycoplasmae means that they are highly dependent upon their host for their nutrition and reproduction, and, since they do not have a protective cell wall, they are not very robust when excreted by the bird into the environment. For this reason it requires close contact for spread, and intensive rearing in a poor environment encourages such spread. The fragile nature of the mycoplasma means that infected premises can be successfully cleaned and disinfected between flocks.

The importance of good biosecurity in maintaining mycoplasma-free flocks cannot be overstated. Primary and commercial breeding flocks are monitored regularly for Mg by blood testing for antibodies.

The newer live vaccines are used mainly to protect against egg production losses in commercial layers. They may also displace endemic strains on multi-age sites. These vaccines are avirulent and should have advantages over the F strain live vaccine that was used in parts of the USA.

Dr. Janet Bradbury

## UK clinical perspective

David Parsons BVetMed. MSc CertPMP MRCVS



## Clinical Signs

### CHICKENS

- Coryza, foamy secretion in the eye, tracheal rales, open mouthed breathing,
- Reduced feed consumption, loss of weight which will be worse in broilers
- Drop in egg production in laying flocks.
- Breeding flocks will suffer reduced hatchability and chick viability.

Morbidity can reach 100% and tends to be worse in the winter months. Mortality is variable being negligible in adults but up to 30% in broiler flocks again depending on the involvement of secondary infections.

### TURKEYS

- Nasal discharge (coryza), foamy secretions in the eye
- Swelling of the infraorbital sinuses which can lead to closing of the eye
- Weight loss due to the inability to find feed and water.
- Coughing, tracheal rales and mouth breathing.

The encephalitic form can result in ataxia (uncoordinated gait), torticollis (twisted neck) and opisthotonus (neck back).

Again, in laying birds there will be a drop in egg production and in breeding birds reduced hatchability and poult viability.

Morbidity and mortality highly variable depending on the involvement of secondary infections.

## RECENT CASES IN COMMERCIAL POULTRY:-

The signs described above fit well with my recent experience of infection in caged layers and free range flocks. The former initially showing signs of respiratory infection, an increase in mortality to 0.2-0.3%/week and lowered egg production. The latter showed no clinical signs other than reduced egg production and increased mortality. In both cases the presence of Mg was confirmed serologically.

Veterinary Investigation Centre reports have described the following cases between November 2000 to July 2002, confirming not only the presence of Mg in different types of stock but also that secondary infections commonly occur.

### CLINICAL CASE REPORTS

#### 1: Free range layers

Sinusitis and ocular discharge seen with 10% of the hens affected. The problem had existed for several months.

Culture and PCR demonstrated the presence of *Mycoplasma synoviae*, *Mycoplasma gallisepticum*, *Mycoplasma iners* and *Mycoplasma gallinarum* from the majority of the birds examined.

#### 2: Small flock of 100 chickens

Sinusitis and Upper Respiratory Tract disease. Extensive mucus in trachea and sinuses. Blood samples were Mg positive.

#### 3: Fancy Fowl

Flock of fancy poultry breeds. Periodic sneezing. All 4 bloods were Mg positive. One was seropositive for TRT/ART.

#### 4: Pheasants

i) Coughing and sinusitis in pheasants poults. Post mortem examination confirmed the sinusitis. Some birds were infected with gapeworms. The birds were serologically positive to Mg and *Pasteurella gallinarum* was isolated from lungs and sinuses.

ii) 16 birds had been culled out of a group of 18,000 on 2 consecutive days with conjunctivitis. These culls were from 4 pens of 250 birds. Post mortem confirmed the conjunctivitis but there was no sinusitis. *Mycoplasma gallisepticum* and *Mycoplasma iners* were isolated.

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## Diagnosis

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Confirmation of the diagnosis requires either:-

1. Culture and identification of Mg from affected birds
2. Demonstration of seroconversion (from Mg negative to Mg positive), ideally on paired sera from the same bird or on a flock basis, using one of the following:
  - Rapid Serum Agglutination test,
  - Haemagglutination Inhibition test
  - ELISA (Enzyme Linked Immunosorbent Assay) test
  - PCR (Polymerase Chain Reaction) test to demonstrate the presence of Mg DNA

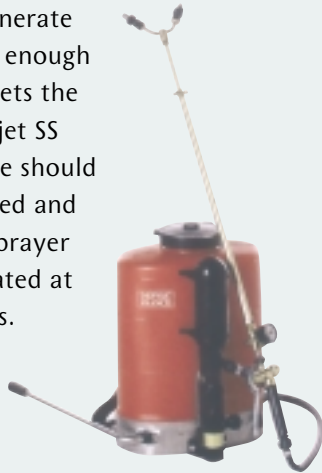
This infection is a bigger threat to extensive production systems, particularly farms producing eggs for human consumption as there are limited treatment options available.

# Nobilis® MG 6/85 vaccine now available in UK

This vaccine is administered in the form of fine spray/aerosol, in order to reach the bird's respiratory system and induce an adequate immune response. Ordinary garden sprayers or knapsack sprayers are not suitable for this vaccine because the resulting droplet size is too large.

A modified knapsack sprayer, the Birchmeyer sprayer, is available from Desvac ([www.desvac.com](http://www.desvac.com), Tel +33 608987915) and is suitable for application this vaccine. Fitted with a pressure gauge, it comes with three sets of nozzles.

To generate small enough droplets the Conejet SS nozzle should be used and the sprayer operated at 6 bars.



Alternatively other sprayers like the Atomist electric sprayer (Instruvet, Holland) or the Turbair Electrafan (Micron) can also be used.

## THE SPANISH CART SPRAYER



This sprayer was specifically designed by Intervet Spain for maximum convenience with MG 6/85 vaccination. If you would like to discuss use please contact your veterinary surgeon or the Intervet Poultry Department direct on 01908 685249 or at [poultry.uk@intervet.com](mailto:poultry.uk@intervet.com)

## Preparation of vaccine & aerosol administration



The vaccine should be reconstituted with distilled or de-ionized water and applied in the volume of 250-500 ml/ 1,000 birds (Birchmeyer sprayer) depending on the age of birds and type of housing. See manufacturer manuals for volume of water for Atomist and Turbair Electrafan. Successful application of vaccine relies on "closed" sheds, and ventilation at this time should be shut down.

Nobilis MG 6/85 is a live, freeze dried vaccine containing live attenuated *Mycoplasma gallisepticum*. For reconstitution and administration by spray vaccination. Vaccinate healthy chickens only. Legal category **POM**. Nobilis MG 6/85 vaccine can only be prescribed by a veterinary surgeon from whom advice should be sought. VM 01708/4480



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