

Comments on MS Risk factors and interventions

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MS (*Mycoplasma synoviae*) infections in chickens in Georgia are asymptomatic. Positive broiler breeder flocks are detected through active surveillance (NPIP). Once infected, flocks are positive for life and shed the bacteria into their environment and vertically to their progeny.

PRIMARY SOURCES AND FOMITES:

Sources of MS include positive broiler or breeder flocks, most backyard flocks and most commercial layer flocks. Positive birds contaminate their immediate environment, especially dust, litter, and house equipment. Rodents carry the bacteria mechanically and they can move freely between poultry farms without a line of separation. Some wild bird species have been reported to carry MS but we have not documented this in Georgia.

Transmission:

Airborne:

Possible, but unlikely as all the ideal conditions must be met (i.e. air direction, speed and temperature, traveling short distances) for transmission to happen from one house to the other. However, MS on dust, feathers or flies using an airborne route is more likely to travel between houses of the same farm.

People:

On breeder farms, MS is believed to be mostly walked into houses by people. MS may survive for 1-4 days on hair, in human noses and on clothing.

Equipment and Vehicles:

MS also survives on equipment, tools and supplies used in contaminated houses or vehicles used to transport positive birds.

Spiking and Moving birds:

The practice of spiking breeder flocks is very risky because introducing MS positive birds into several negative flocks is probably the most efficient way to infect them. Testing spike males by PCR on oropharyngeal swabs within a week of the move is absolutely critical in the control of MS.

Litter and Land Cover:

Farms surrounded by a large proportion of pasture as a type of land cover are more likely to be infected with MS. One explanation for this observation is that this type of land cover may be spread with MS contaminated litter increasing proximity to a source of MS for the farm (Figure 1) and that the same pasture provide an opportunity for rodent populations living in pasture to take refuge in poultry houses.

Rodents:

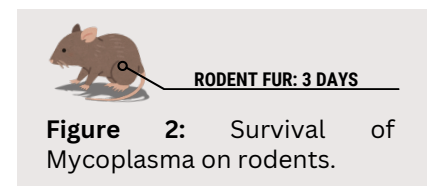
We have also found that farms with rodent populations identified as problematic are more likely to have MS (Figure 2).

Vertical Transmission:

MS is vertically transmitted. When MS positive breeder flock detections increase in the field, there is a corresponding rapid rise in the number of positive broiler flocks produced from these breeders, increasing disease pressure. At some point, a critical mass is reached when enough positive broilers are placed for them to become a significant new source of infection for pullets and breeders.



Figure 1: Survival of Mycoplasma in manure.



CONTROL AND INTERVENTIONS:

Biosecurity practices to reduce MS:

1. To reduce farm to farm transmission: always visit, service and feed positive flocks last.
2. Because infections are silent, assume any farm may be positive and use proper entry procedures on every farm, every day: always change or disinfect footwear, wash hands and use hairnets.
3. Practice strict rodent and insect control.
4. Bird proof houses.
5. Disinfect equipment and tools used on farms.
6. Keep vehicles sanitized and clutter free.
7. Train hired help before their first day on the job about the line of separation and the importance of not having contact with backyard birds.
8. Avoid unnecessary visitors on farms. Essential visitors wear full PPE every time.
9. Test by PCR within one week of movements of pullets and spike males.

Education:

Education of poultry farmers and their hired help (in their languages) is crucial for disease control, including MS. They should never be allowed to keep backyard chickens at home (as a condition for employment) and should understand the WHY of the line of separation. The same biosecurity precautions and MS education practices should be in place with moving crews as with growers and hired help on farms.

Antibiotics:

Treating flocks with antibiotics preemptively does not stop them from getting infected. Treating the flock once MS is detected reduces but does not completely stop egg transmission and shedding. A positive flock is positive for life.

Selling Early and Biosecurity:

In a highly populated broiler breeder area with multiple detections, we have found that 2 factors will slow down new detections: selling positive flocks early when the market allows, and heightened biosecurity (for example due to AI scares). The most critical biosecurity principles are training of employees, visitor control, strict PPE policy, rodent control and full compliance with the line of separation (Figure 3).



Figure 3: Critical biosecurity principles.