

# Live *Mycoplasma* vaccines and use of monitoring

**For unvaccinated flocks, enzyme-linked immunosorbent assay monitoring is an effective tool to prevent disease spread through the early detection and control of infection.**

For those poultry flocks that have not been vaccinated against *Mycoplasma*, monitoring is an effective tool to prevent the spread of disease through early detection and infection control. Recent serological data on live *Mycoplasma* vaccinated flocks have shown that an enzyme-linked immunosorbent assay can be used to indicate successful vaccination or a field challenge. A preventative program using enzyme-linked immunosorbent assay monitoring and controls should aim to prevent egg production losses due to *Mycoplasma* infections.

## Early detection in non-vaccinated flocks

The purpose of monitoring flocks, assumed free of infection, is to confirm their negative status or to detect, as early possible, infection with *Mycoplasma gallisepticum* or *Mycoplasma synoviae* following a challenge. Early detection in multiplier flocks is highly important as, when a flock becomes positive, the measures needed to stop the disease spreading and the confirmation tests are costly.

Any test used for monitoring should be both highly sensitive to ensure early detection and highly specific for confirmation.

## Vaccination as a control tactic

Vaccination against *M. gallisepticum* or *M. synoviae* is an option where

maintaining flocks free of infection is not feasible, for example on multi-age commercial layer farms.

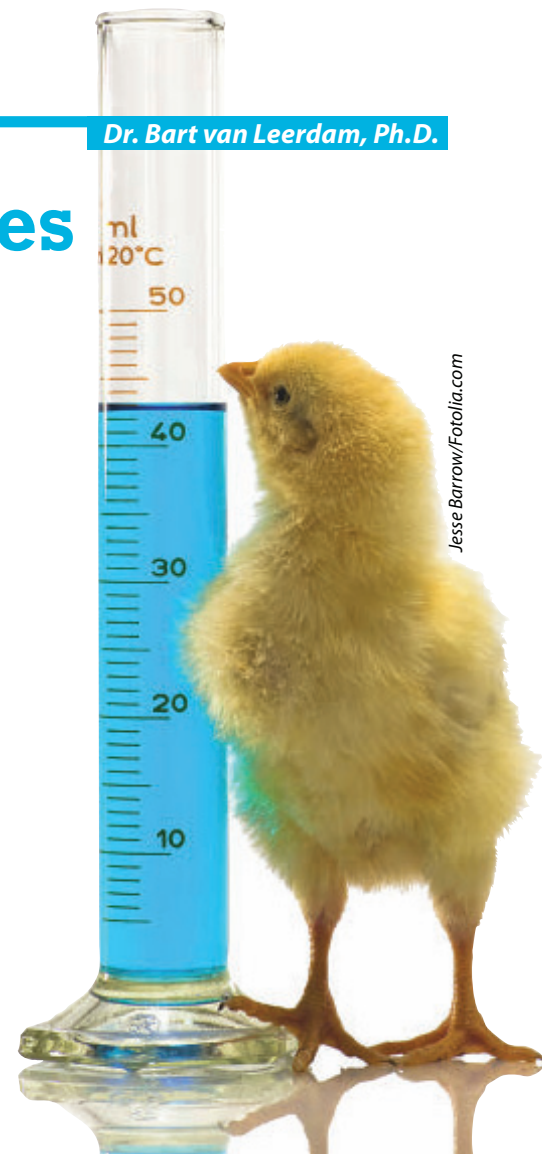
Both killed vaccines, bacterins and live vaccines are used. Bacterins can reduce a decline in egg production associated with *M. gallisepticum*, but they do not prevent infection, and live attenuated, or naturally mild, strains are used in some countries. In addition, live vaccines may be helpful in displacing field strains on multi-age sites.

## Live vaccination monitoring

The use of live *Mycoplasma* vaccines has become increasingly popular. There are three commercially available products, F-strain, 6/85 and Ts-11. From a serological perspective, there are major differences between the vaccines.

The F-strain establishes a permanent colonization in vaccinated flocks, which is reflected in their serology. F-strain vaccinated flocks show positive serology after 8-12 weeks of age and will seroconvert to 100 percent positivity. The more attenuated strains of Ts-11 and 6/85 have a more limited potential to spread from bird to bird.

The main serological differences on an enzyme-linked immunosorbent assay between 6/85 and Ts-11 is that 6/85 will show no, or very limited, seroconversion after vaccination, while Ts-11 will show



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partial, fluctuating seroconversion (30-70 percent positive).

The advantage of the negative serology after vaccination with 6/85 is that vaccinated flocks can be easily monitored for field infection. In the case of Ts-11, differentiation of vaccination serology and field challenge serology will have to be carried out by evaluation of mean flock titers with baselines and evaluating percent positives. Flocks that show mean titers above baseline and are 100 percent positive are suspect of field challenge.

For the F-strain vaccinated flock, evaluating serology for evidence of challenge may be more difficult as vaccinated flocks normally show 100 percent positivity. For F-strain vaccinated birds mean titers well above established baselines indicate challenge.

Live vaccination against

**Table 1. Interpretation M gallisepticum ELISA titers 6-12 weeks post vaccination with Live M gallisepticum vaccines.** (A titer of  $\geq 668$  is positive.)

Vaccination history	Non challenged			Field challenged		
	Flock result	Mean titer	% POS	Flock result	Mean titer	% POS
MG F-strain	POS	2000-8000	100	POS	no data	100
MG 6/85	NEG	NEG	0	POS	1000-23000	10-100
Vaccianted ts-11 No wild challenge	POS	1000-3000	30-70	POS	5000-23000	90-100

Monitoring for antibodies must be carried out prior to vaccination with live vaccines.

**Table 2. Interpretation M synoviae ELISA titers 6-12 weeks post vaccination with M synoviae-H live vaccine.** A titer of  $\geq 668$  is positive.

History	Non challenged			Field challenge		
	Flock result	Mean titer	%POS	Flock result	Mean titer	%POS
Non-vaccinated	NEG	NEG	0	POS	1000-23000	10-100
Vaccianted MS-H No wild challenge	POS	500-3000	30-70	POS	5000-23000	100

Enzyme-linked immunosorbent assays can be used to differentiate vaccinated flocks from those undergoing a challenge.

*M. synoviae* is a relatively new topic when compared to live *M. gallisepticum* vaccination, and the only commercially-available live *M. synoviae* vaccine is the *M. synoviae*-H vaccine. Experience from Australia, South Africa and Europe, suggests that the *M. synoviae*-H vaccine has characteristics similar to Ts-11. This is also reflected in the serology, where the *M. synoviae*-H serological pattern is very similar to Ts-11.

The serological interpretation of the various live *Mycoplasma* vaccines has been summarized in Table 1 for the various *M. gallisepticum* vaccines and Table 2 for the live *M. synoviae*-H vaccine.

Successful use of live *Mycoplasma* vaccines requires that they must be applied before a flock becomes infected with a field strain. Therefore, monitoring for the absence of antibodies should be conducted immediately prior to vaccination. Testing prior to vaccination will confirm negative status of the flock, thus ensuring optimal application of the live vaccines.

**Read: Controlling mycoplasmosis in pheasants**  
[www.WATTAgNet.com/16978.html](http://www.WATTAgNet.com/16978.html)

### Importance of live vaccination monitoring

Experience from various parts of the world suggests that enzyme-linked immunosorbent assays can be used to monitor the success of live *Mycoplasma* vaccination, and to differentiate vaccinated flocks from those flocks undergoing a *Mycoplasma* challenge.

A common serological misconception about live *Mycoplasma* vaccines is that observed rising antibodies following field challenge indicate vaccine failure. This may not be so.

Suspect serology can only indicate the presence of a field challenge. Suspect serology with the absence of clinical symptoms, might

simply indicate that the vaccinated birds were challenged and displayed successful resistance to colonization with a field strain of *Mycoplasma*. Infections with field strains can only be confirmed by differential culture/polymerase chain reaction techniques for wild type *Mycoplasma*.

Rising antibody titers detected through monitoring however, will indicate the need for enhanced biosecurity and effective timing and application of live vaccines to keep flocks free from challenge.

Field experiences involving the use of live *Mycoplasma* vaccines also suggest that the live vaccines may be viable tools for displacing and eradicating *Mycoplasma* field strains on multi-age poultry farms. This is due to a decrease in serological response to normal baselines following prolonged use of live vaccines, indicating the loss and exclusion of field challenge. □

› *Dr. Bart van Leerdam is a poultry business director with BioChek B.V., Holland. Email: info@biochek.com*