

Mycoplasma gallisepticum Vaccines in Broiler Breeders

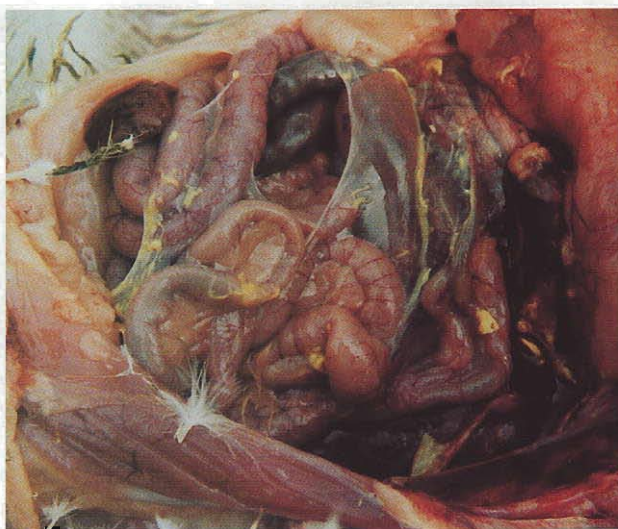
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Worldwide, *Mycoplasma gallisepticum* (MG) is an important pathogen of poultry responsible for economic losses caused by complicated post vaccinal reactions, decreased egg production/hatchability, egg downgrading, carcass condemnations, and decreased feed efficiency.

There are basically two types of MG vaccines in the market: inactivated (bacterins) and live attenuated.

Inactivated vaccines have the advantage of avoiding the introduction of a live microorganism inside the poultry premises, but they are often expensive and do not protect against a heavy field challenge.

In spite of stimulating a high level of serum antibodies as a result of increased IgM (Immunoglobulin M) and IgG production, it has been demonstrated that they do not afford good protection. One of the first live vaccines available was F strain, and in recent years two new products with a higher level of attenuation, 6/85 and ts-11, have been commercialized in several



Peritonitis in a broiler breeder infected with Mycoplasma gallisepticum

continents. Ideally, a good MG live vaccine should be able to protect against egg production losses, respiratory disease, and egg transmission, and may be used as a tool to eradicate MG from infected flocks. In order to achieve that, it must multiply in the vaccinated bird long enough to stimulate a long-term protective immunity without causing disease and, ideally, without spreading to other susceptible

birds. As far as persistence in vaccinated birds, ts-11 can be reisolated or detected in the trachea using different techniques. Turner and Kleven (1998) have reported the identification of this vaccinal strain in commercial layers up to 76 and 100 weeks of age using RAPD (Random Amplified Polymorphic DNA), a finding that indicates a long persistence in the trachea. Also ts-11, a temperature sensitive, chemically-induced mutant strain that grows well at 33°C, but poorly at 39.5°C, is capable of replicating in the mucosal trachea without surviving in the oviduct because of its inability to withstand temperatures higher than 39.5°C,

thereby avoiding the presence of transovarian transmission in the progeny.

In our experience in Mexico, we have not been able to detect any degree of vertical transmission in the progeny of vaccinated broiler breeders (See Table 1.)

Frequently, the immunogenicity of a poultry vaccine is measured in terms of the serologic response elicited, even though many scientists have demonstrated that there is not a direct correlation between MG serum antibody levels (humoral antibodies) and protection against challenge.

Taking into consideration that MG is a 'parasite' of the respiratory airways, some researchers have quantified the antibodies present in the tracheal mucosa, trying to obtain a more accurate method to determine resistance to infection, instead of using the traditional serologic tests.

In Mexico, we have been able to detect that 30-90% of the serum samples tested using the serum agglutination plate test (SAPT), appeared positive in birds vaccinated with ts-11.

However, in the Hemoagglutination Inhibition (HI) test, less than 10% of the positive samples in SAPT appeared positive (usually showing very low titers.)

In summary, an ideal vaccine against Mg must be safe to use, stimulate local immunity in the respiratory tissues and improve flock performance with a positive cost/benefit ratio.

Table 1. PCR/MG results obtained in the progeny of broiler breeders vaccinated with ts-11 at different ages in several companies in Mexico. Tracheal swab samples (20 per flock) were collected in the hatchery

Flock No.	Vaccination age (weeks)	Flock age (weeks) when samples were collected	PCR/MG results in day-old baby chicks
1	16	61	Negative
2	16	53	
3	16	46	
4	16	39	
5	4	55	
6	4	52	
7	4	43	
8	4	37	
9	4	31	
10	4	45	
11	4	45	
12	4	45	
13	4	45	
14	4	53	
15	4	46	
16	4	39	
17	4	32	
18	4	39	