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Salmonella vaccination - introduction

Vaccination is a process that stimulates the bird's own immune system to endow the bird with a particular immunity against a particular infection. Vaccination has been used successfully to counter salmonella infections. Originally used for Salmonella pullorum and gallinarum control, vaccination is still used in some parts of the world against the latter and, where it is used in high risk areas, control is usually good.

Vaccination again came to the fore as a control option when *S. enteritidis* emerged in the UK. Vaccination of UK table egg laying flocks was accompanied by a dramatic reduction in cases of human food poisoning attributable to *S. enteritidis*. Nowadays, vaccination is a mandatory requirement of *S. enteritidis* containment programmes in many countries.

Vaccine types

There are both dead and live salmonella vaccines. The dead vaccines have the disadvantage in that they need to be administered to every bird by injection, but it is claimed that they have the benefit of usually producing a stronger and more persistent vaccinal immunity and, when used in breeders, of providing more maternal immunity to progeny chicks.

The live vaccines, on the other hand, can be mass applied via the water. They give a local immunity in the gut but the general immunity that they induce may not be as long and persistent as that obtained from a dead vaccine. However, some authorities claim live vaccines give better protection! This mixture of claims probably reflects the fact that there are various salmonella vaccines and different claims arise depending on which specific live and dead vaccines are being compared. If a live vaccine is inadvertently killed, for example by a sanitiser in the drinking water, then there can be a flock vaccination failure.

Typically, vaccines are made against a specific serotype although the protection conferred is usually serogroup specific. That is, *S. enteritidis* (which is a serogroup D salmonella) vaccination will also confer protection against other serogroup D serotypes and *S. typhimurium* (a group B salmonella) will also confer protection against other serogroup B serotypes.

Vaccination of laying birds, while obviously protecting the birds themselves against disease, also greatly reduces shedding of salmonella from the birds into the environment or vertically through their eggs.

Vaccination issues

Both dead and live vaccines have been regularly associated with effective salmonella control although both may not be 100% effective when there is a very heavy salmonella challenge.

Feed and water deprivation and environmental stresses, such as high environmental temperatures, can compromise vaccination efficiency.

One problem in vaccinating breeders is that vaccinated birds become serologically positive, which negates the value of serology as a diagnostic tool or as a means of confirming the salmonella status of a flock.

Interestingly, the *S. gallinarum* 9R vaccine strain can generate protective immunity against *S. enteritidis* without impairing the detection by serology of infected flocks.

If a live vaccine is being used it is important that the bird has rid itself of the vaccinal salmonella strain by time of slaughter.