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Egg borne transmission

As was mentioned in the last Poultryhealth BYTES disease causing micro-organisms can be transmitted via the egg to the next generation. This transmission occurs on the egg shell or in the contents of the egg. Obviously to be in the egg the micro-organism needs to be incorporated during the production of the egg before the membranes and eggshell are laid down.

For micro-organisms on the shell the micro-organism has to cross the shell or infect the chick at hatching in the hatcher. Crossing of the eggshell is greatly facilitated late in lay when the eggshell becomes thinner and more porous or when the shell becomes more porous because of nutritional (calcium, phosphorus and vitamin D3) imbalances or viral disease challenges, such as infectious bronchitis.

Transmission control

For transmission to occur the disease causing pathogen has to be present in the breeder flock and if it is a micro-organism that can be controlled by medication the use of antibiotics like tylosin, gentamycin or enrofloxacin in the breeder flock can greatly reduce, but necessarily totally stop, transovarial transmission of mycoplasma and, in the case of the latter products, salmonella. It should be noted that the use of gentamycin and enrofloxacin for such uses is not acceptable in many countries because of the alleged potential of antibiotic resistance.

On the mycoplasma front egg dipping with products such as tylosin and gentamycin will also greatly reduce the vertical (mother to offspring) transmission of *Mycoplasma gallisepticum*, *M. synoviae* and *M. meleagridis* (see Poultryhealth BYTES 25).

When we are talking about transmission on the eggshell the egg can be contaminated during the laying process in the cloaca. In this context the hen has been very badly 'designed' in that the contents of the reproductive tract and digestive tracts leave the bird by a common exit (the cloaca) and this facilitates egg shell contamination. In higher animals (mammals), they exit the body separately via the vagina and anus, thereby greatly minimising contamination of an offspring at birth.

In the case of contamination after the egg has been laid the hygiene of the nest box environment is important. Dirty, wet nest box contents favour egg shell contamination with, for example, *Pseudomonas*, *E. coli* and other micro-organisms. The ingress of such micro-organisms is facilitated by the cooling down of the egg from body temperature. As the egg cools, its contents contract creating inwards sucking pressure on the pores or any micro-cracks. One aspect of management worthy of consideration is reducing the time the freshly laid egg has with nest box contents by increasing the frequency of egg collections.

Needless to say, nest box contents should also be kept clean and dry and there are merits in reducing the number of floor eggs.

Egg sanitisation and/or fumigation is another management practice worthy of consideration for the control of micro-organisms on the eggshell. It is generally accepted that the sooner these processes are applied after the laying of the egg the more successful they are likely to be.

With the egg washing process water cleanliness is important and for this reason many people prefer the spray type washers rather than the submersion egg washers because poor management of the latter results in egg submersion in a bacterial soup rather than water. With egg washers, the temperature gradient is important and water temperature should increase as the egg progresses through the spray washer.