Managing respiratory diseases in layers

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Respiratory disease control is very important in all types of poultry including layers. Respiratory infections in layers can have a very significant and damaging effect on bird health, welfare and production and hence on profitability of flocks.

While in meat birds, we worry mainly about the effect of respiratory disease on the respiratory tract itself, in layers we also have to worry in the case of some respiratory infections about the effects on the oviduct.

Respiratory disease can have a significant economic impact in layer production due to mortality in the flock, poor egg production and shell quality problems and increased costs associated with treatment and investigation of disease problems.

To understand how to manage and control respiratory disease in laying flocks, we must first understand why disease may occur and which pathogenic agents may be involved.

The respiratory system of the laying chicken is very different from that of the human.

Avian lungs are very efficient in gaseous exchange but this efficiency makes the bird vulnerable to any defect in air quality.

Respiratory disease on laying sites seldom has a single cause but is more often the result of an inter relationship between several factors which may include infectious agents such as viruses, bacteria and environmental influences.

Infectious agents may be present within a flock without causing harmful effects but any additional 'stress' such as the introduction of another pathogenic agent or some management or environmental deficiency may trigger disease. Thus respiratory disease is usually a complex and multi-factorial problem.

A healthy flock.

Disease is a multifactorial problem.

Environment

Before worrying about controlling particular pathogens in our flocks, we must first ensure that we are providing the optimum environment for the chicken to maintain a healthy respiratory tract.

This means proper attention should be paid to the ventilation system and to temperature control in any layer accommodation both in the brooding and rearing stage and on the laying site. An effective ventilation system should provide plentiful fresh air for the bird without the presence of toxic gases or excess moisture and should be effective in keeping the level of harmful bacteria and other organisms in the air within the shed at a low level.

When planning the ventilation system, it is important to remember that the aim is to maintain optimum air quality 24 hours a day every day of the year.

This is obviously a challenge in many parts of the world including the UK!

In houses where the ventilation system is poor and ammonia levels are high, the resultant damage to the respiratory tract renders birds very vulnerable to respiratory pathogens.

Infectious agents

The pathogens below are those most commonly associated with respiratory disease in laying flocks:

- **Viruses**
  - Infectious bronchitis and infectious bronchitis variants
  - Newcastle disease
  - Avian influenza
  - Avian pneumovirus
  - Infectious laryngotracheitis
- **Bacteria**
  - Mycoplasma gallisepticum
  - Mycoplasma synoviae
  - Escherichia coli
  - Pasteurella multocida
  - Ornithobacterium rhinotracheale (ORT)
  - Haemophilus paragallinarum
  - Erysipelothrix
- **Fungal disease**
  - Aspergillus

Continued on page 16

Continued from page 15

One of the key aspects to managing and controlling respiratory disease is to know as much as possible about the disease conditions which might be present in or likely to affect your flock in the particular area where your poultry operation is situated.

Determining the cause of the respiratory problem in a laying flock requires a forensic approach looking at every aspect.

This would include knowledge of the diseases prevalent in the local area, taken in conjunction with the clinical signs of disease on farm and the results of investigations.

Full clinical investigation may include post mortem examinations, bacterial cultures, histological examination, virological examinations including PCR and viral cultures and serological examinations.

A good set of up to date flock records will also provide invaluable information to help in investigation. Such data should include daily mortality, water consumption, feed intake, egg production, seconds and egg mass.

Where possible, it is useful to take blood samples from laying flocks in rear and shortly after arrival on the laying site.

These samples can be tested to check response to vaccination and/or stored for comparison with later samples if needed in the case of a disease investigation.

When investigating acute disease problems, it is most useful to take blood samples close to the onset of disease followed up by convalescent samples 10-14 days later to see if there is any evidence of rising antibody titres which might indicate recent infectious challenge.

The advent of PCR testing has made the diagnosis of respiratory infections much easier in some cases.

The following case illustrates the benefit of a complete investigation of a respiratory problem. A multi age layer site experienced a marked drop in production associated with increased mortality and sneezing in all flocks on site.

The farmer suspected an IB problem but post mortem examination with bacteriological examination, serological examination and PCR examination showed that the flock were infected with Mycoplasma gallisepticum and Haemophilus paragallinarum and there appeared to be no viral involvement. The flock responded well to chlortetracycline medication.

Control in laying flocks

The best approach is prevention. Prevention of disease relies on a combination of effective biosecurity, good management, strategic vaccination and, where necessary, medication.

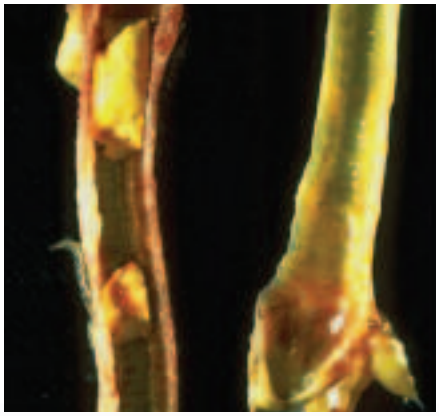
Good biosecurity means that you introduce your birds onto a site which has been effectively cleaned and disinfected and that you maintain that site in such a way as to protect your birds as far as possible from the introduction of pathogenic agents. Like ventilation, good biosecurity is required 24 hours per day every day of the year!

Unfortunately, on layer sites, there is inevitably movement of vehicles on and off the site collecting eggs. If not carefully managed, your biosecurity arrangements can easily be breached.

The number of vehicles and visitors having access to the site should be kept to a minimum. Use single age all in, all out sites where possible – not always convenient on layer sites where a year round supply of eggs is required but a big advantage in controlling disease.

Most layers have a very intensive vaccina-

Fowl plague.



Damage to respiratory tract by ILT.

tion programme in rear to protect them as far as possible against viral respiratory disease challenges in rear and in lay.

The vaccination programme should be planned in consultation with your veterinarian to ensure that it is appropriate to protect the birds in the area where they will be housed.

This is particularly important to consider if birds have been reared in an area at some distance from their eventual destination as the local disease risks may be different and this must be taken into consideration when planning their vaccine programme. Vaccines will only be effective if properly administered.

In addition to vaccination during the rearing period, it has become increasingly common for producers to vaccinate during the time birds are on the laying site, mainly with additional IB and IB variant vaccines to 'top up' immunity to these infections.

This has proved a very effective approach on many farms. It is important to tailor the vaccination to the requirements of the laying site. In addition to vaccines to protect against viral respiratory disease, there are also vaccines available to protect against Mycoplasma gallisepticum, Mycoplasma synoviae and bacterial infections such as Pasteurella multocida and erysipelas.

Medication

Antibiotic medications may be used in a strategic way to try and prevent disease, for example, on a multi age site where mycoplasma infection is established or they may be used to treat outbreaks of acute mycoplasma or other bacterial disease.

The range of antibiotics available for treatment of respiratory disease in laying birds is small compared to meat birds as there are few products available with a zero egg withdrawal period.

However, those products that are available can often be used to good effect and are useful tools in the management and control of respiratory disease in layer flocks.

Key points to consider in managing and controlling respiratory disease on layer sites include:

- Use single age all in, all out sites if possible.
- Know the likely risks and challenges present on your farm and in your local area.
- Keep your biosecurity and your vaccination programme under constant review and be prepared to change in response to changes in disease risk either on your farm or in the local region.
- Remember that most disease problems are multifactorial and make sure that you control other diseases and parasite problems, for example, worms and red mite as flocks which are healthy in every other way are less likely to succumb to respiratory disease.
- Aim to maintain mycoplasma negative flocks if possible as this makes disease control simpler.
- Keep flock records up to date (and look at them!) so that you can evaluate performance and also pick up any early signs of possible disease problems, for example, fluctuations in feed or water intake.
- Make sure that what you are diagnosing as a respiratory disease is, in fact, a respiratory problem.

In conclusion, managing respiratory disease in laying flocks is an ongoing and frequently frustrating challenge for the flock owner and his veterinarian.

Time spent in investigating problems thoroughly and gaining understanding of what is happening on your particular site will pay dividends in improved control and greater profitability with your laying flock. ■