

Avian influenza – think biosecurity!

Avian influenza, be it of the high or low pathogenic form, is a viral disease and so once a poultry flock is infected, there is no cure. This being the case, all control strategies have to be based on prevention rather than cure, because products such as antibiotics will not work.

The main ways to control avian influenza are by vaccination and good biosecurity. Much has been said in recent months about vaccination, so this article will focus on the role of biosecurity in the prevention, control and management of avian influenza.

Ultimately, all avian influenza viruses come from poultry or wild birds and this fact, and our understanding of it, is the cornerstone to any biosecurity programme.

For avian influenza to affect your flock the virus needs to move from these sources and into your flock.

This has three key stages. Firstly, the virus must leave the bird(s) it is in, secondly, it must travel to your flock and, thirdly, it must get into at least one bird in your flock. Once there that bird will effectively become a viral multiplication unit and will shed large numbers into the environment and many more birds will quickly succumb to the disease.

The faecal route

So, how does the avian influenza virus leave an infected chicken? The virus leaves a bird mainly by the respiratory and faecal routes so, when it comes to biosecurity, we need to appreciate the dangers of faeces, respiratory secretions and droplet or airborne transmission.

Thus, for avian influenza to spread to your flock it must have bird contact or it must have contact with faeces, respiratory secretions or airborne droplets that have originated from an infected bird or flock.

The first aspect of a good avian influenza biosecurity programme focuses on ensuring no contact with other birds occurs.

As far as other poultry are concerned this

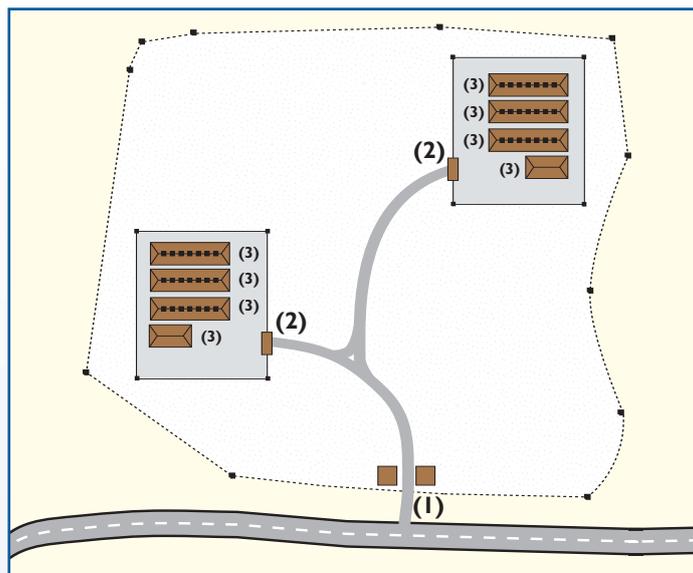


Fig. 1. The three levels of biosecurity – site (1), farm (2) and houses (3).

means operating the farm as a single flock, all in, all out farm and avoiding operating large multi-age farms. It also means taking a very close look at spiking if this is a management tool that you use.

Spiking is the practice of introducing fit young virile males into a flock in the second half of lay to replace the males that were there and have lost the desire or ability to do their duty. If these males are diseased or, of more concern, perfectly fit but incubating a disease such as avian influenza, they will bring it into your flock.

In this context it is well worth remembering that the incubation period (the time between the virus getting into the bird and that bird showing clinical signs) is several days and that the peak of virus shedding is in the period of time just before the clinical signs are manifested.

Thus, the unfortunate scenario can arise in which apparently healthy birds showing no signs of disease are moved into a flock and a couple of days later the flock of origin succumbs to disease.

In such a situation the recipient flock also invariably go down with the disease shortly thereafter.

Obviously the taking of additional chickens into a breeder flock is something we can control but what is not so easy to manage are the wild birds.

Wild birds present two risks. Firstly, they can actually get into the house and contaminate the flock, their feed and water and its environment.

Secondly, wild birds can deposit their faeces in the vicinity of the poultry house and these can then be inadvertently transferred into the house and infect your flock.

Let us consider the former scenario first. To get into the house there must be an entry point. These can be there all the time and include holes in netting on open sided houses, gaps above and below doors, fans not in use without appropriate netting in place and the holes that occur under the eaves when corrugated roofing sheets are used.

Needless to say, these entry points are there all the time and management needs to detect them and seal them up.

Some entry points provide transient opportunities and these are typified by a lapse in procedure by a member of staff.

These invariably arise because a door is left open. If this is the case then why not have self-closing springs on your doors?

The door that is most likely to be left open is the one into the lobby. This being the case, it is prudent to ensure that the lobby and the area housing the flock are totally separated from each other so that if a bird enters the house it is confined to the lobby area and does not have access to the breeder flock.

Proximity of other birds

Then we need to consider the danger of birds in the vicinity of breeder houses and the biggest threat to our flocks is the faeces they produce as these can be inadvertently carried into the house.

Thus, we need to make the area around our breeder houses as unattractive as possible for wild birds. This means no feed spillages and no drinking water sources.

In addition, we should not provide nesting
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or roosting opportunities on our houses, for example under the eaves, or near by.

Finally, we should avoid standing water in open drains and long grass/vegetation as these favour insect populations that certain species of wild birds feed on. Some insects use standing/stagnant water to breed in – they lay their eggs there and then on hatching large numbers of young insects are released that are really attractive to some species of wild bird.

With a little bit of careful thought and planning you should be able to keep wild birds out of your breeder houses and minimise the number of birds in the vicinity of the houses.

Then we come to the issue of the inadvertent transfer of infected faeces (or respiratory tract excretions) into the house and we will now focus on this.

Let us put the faecal risk into context. Just one gram of faeces from a chicken at the point in time when its excretion of highly pathogenic avian influenza virus is greatest will contain enough flu virus to kill millions of chicks.

Conversely, it requires very little faecal material to infect a chicken and such small amounts may not be easily seen.

Anything going into our breeder house has the potential to be contaminated with faecal material so our basis of controlling this risk is to know everything that goes into our

breeder house and to ensure that these carry no faecal material into the breeder house. Remember not everything enters the house via the front door!

We will now consider the different things that come into the poultry house and what we can do to remove any risk associated with them.

● **Feed.** Every bird eats every day and if the feed is contaminated it would be very easy to quickly infect a large number of birds. If the feed is heat treated, pelleted or chemically treated the risk of contaminated ingredients is reduced.

This being so, the most likely way that feed could bring avian influenza into your breeder flock is if the feed, the lorry or the feed bags are contaminated after the feed has been produced.

For example, there is a real danger with the open topped bulk lorry that is filled under a loading bay canopy in which dozens, or even hundreds, of pigeons are roosting and periodically producing faeces.

But the feed story does not stop there. What about the bulk bin without a top or whose top has been left open? What about the bagged feed on the farm that is not wild bird proofed?

Bags are often contaminated with wild bird or vermin faeces, so why not play safe and develop a feed management system that keeps the actual bags out of the breeder house?

● **Water.** Again, with water every bird drinks every day and so if influenza virus (faeces) gets into your flock's drinking water supply many birds will be quickly infected.

First of all we need to give consideration to the source of the water. Water from lakes or ponds with large duck or waterfowl populations is bad news. These birds naturally deposit their faeces in the water so that your so called 'water' is in some scenarios a faecal consommé! Ideally your water should come from the public supply or a deep well.

If the water is not chlorinated then it should be and if this is done on farm a key management task is to ensure that the chlorination process is being undertaken continuously and that the desired chlorine level in the water is being achieved all the time.

We also need to ensure that the water supply, whether it is in external storage or header tanks, can not be contaminated with wild bird droppings.

● **Bedding materials.** Here again, this is an item which every breeder bird will come into contact with. Ideally, you need to know its source and how it has been handled prior to it arriving at your farm and if contamination with wild bird droppings could have occurred.

Obviously visual inspection is out of the question because you are looking for the proverbial needle in a haystack. However, if you take samples of the bedding material to the laboratory and request a coliform or

enterobacter count to be undertaken this will give you an indication of the level of faecal (all types) contamination in the bedding material.

This is because these two bacteria normally only occur in faeces or products that have experienced faecal contamination.

Then we come to the question of can we treat bedding material to eliminate microbiological risks? Here there are real problems relating to the amount of material involved.

Some people advocate fumigation, but in most situations this only controls microorganisms on the surface of the material and not throughout its mass.

In some tropical countries process that harness the heat in the sunshine are used with some success. Basically, this is used to heat up the bedding material to micro-organism lethal temperatures.

● **People.** Anybody coming on to the farm represents a risk as they are capable of bringing infection or faecal contamination on to the farm. In reality, the risk is greatest with those people who go into the breeder farm and actually handle the birds and the level of this risk correlates to the amount of time spent with the birds.

So, the first rule is to only let people go in among the birds who really need to do so.

Then we need to consider our process for making the risk that these people present as low as possible. Firstly, this can involve requiring a period of poultry freedom (say,

three days) before they are even allowed on the farm.

When they get to the farm absolutely nothing they bring with them (including mobile phones!) should be allowed on the farm and they should be required to shower and change into company provided clothes that remain on the farm. Prior to entering any breeder house they should re wash their hands and apply an appropriate skin sanitiser.

In reality, on a large breeder farm controls should be occurring at site, farm and house level. Some grandparent or elite farms actually operate a shower on entry policy at both farm and house level.

Every door through which people pass to enter the house should have a foot dip and that foot dip must be used! The double dip approach is to be preferred. This involves two dips. The first contains water and is used to clean the boot before it is placed in the second one which contains the disinfectant.

● **Equipment.** Any equipment going on to the farm and, especially, any equipment going into a breeder house is capable of carrying virus or faecal material on it. When it comes to control the obvious strategy is to not take anything into the house and it is surprising if you implement this how the movement of items around a breeding division dramatically reduces and the obvious risk of introducing disease also declines.

Obviously in the real world some things have to go into the farm and then into the breeder house. When this occurs you need to be sure that adequate cleaning and sanitation of the item occurs.

For each item that goes into the breeder house you need to ask the following two questions:

● Does it need to go into the breeder house? If the answer is 'No' stop it going in. If the answer is 'Yes' ask the second question, which is:

● How can I make it safe?

Finally you need to look at every task and function and again ask if there is anything you can do to reduce risk.

A good example here is sweeping. There is a real risk if the brush that is used outside the house gets into the house because the bristles will be highly contaminated.

Why not paint the handle of every outdoor brush red and make it quite clear to staff what this means and that you never want to see an outdoor brush with its red handle inside a house.

In many ways your biosecurity depends upon you identifying everything that comes into your farm and, in particular, everything that goes into the breeder house and then devising management procedures to control any risk associated with it.

Remember the easiest and the most effective action is not to let it go into the farm or the breeder house! ■