

Aspergillus in the hatchery

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This is the second of three articles on aspergillus within the breeder operation. The first article concentrated on the breeder farm which is the main cause of contamination of the hatchery. This article concentrates on the hatchery, which is the main proliferation site, and practical methods of aspergillus control within the hatchery.

The hatchery is the second link in the chain of infection to the broiler farm, as conditions for aspergillus growth and sporulation are ideal.

Incubation requires high levels of humidity, high temperatures, airflows and during the hatching process produces high levels of organic dust (chick fluff). This is exactly what is required by aspergillus spores to complete their life cycle.

Once a hatchery becomes heavily infected it will be impossible to eradicate the problem. Due to the continuous hatching process, cross contamination will always be the issue, however control is very effective provided strict hygiene and proper disinfection is adhered to.

Aspergillus in an embryonated egg.



Egg storage.

Sources of contamination include:

- Aspergillus will enter the hatchery in the egg via hair cracks and porous shells, or in dust on the egg shells or packaging (the main cause of hatchery contamination).
- The spores will enter via the ventilation system and colonise internal air handling

units and evaporative cooling system.

Spores can arrive with any delivery of organic material, for example packaging, especially if allowed to become damp prior to delivery. Aspergillus will grow on virtually anything organic if other conditions such as warmth and humidity are available.

Arriving at the hatchery

As mentioned in the previous article, eggs should be of good quality, clean and should not contain hair cracks or have porous shells. Any eggs which have been cleaned, are dirty, or floor eggs, should be separated and, if possible, incubated and hatched in different machines. This will allow extra disinfection of eggs at high risk. Treat these before and several times during incubation with a fog or smoke treatment containing Enilconazole.

Storage prior to incubation

Eggs will normally be stored at temperatures of between 16-20°C with a relative humidity of 70-80%.

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Temperatures for storage are normally decreased to the lower end of this scale when eggs are stored for long periods. To maintain these conditions refrigeration and humidity units are used. These must be kept clean and not allowed to drip water or spray directly onto eggs.

Remember, when eggs are cooled rapidly, they contract and draw spores and other micro-organisms through the pores in the shell. This is accelerated by moisture collecting on the shell. Eggs should never be allowed to become wet in the store.

Prior to incubation eggs may be pre heated. At this time care must be taken to avoid 'sweating' or condensation on the

shell surface due to sudden temperature/humidity change.

Incubators and incubation

Extreme care should be taken at this time to handle eggs gently, as eggs cracked and infected by spores at this time will severely contaminate the incubator.

Ensure that the turning mechanism of the incubator is working correctly and not jerking or dropping in any way as eggs regularly crack in incubators during turning.

Any eggs seen to be cracked during incubation should be removed and placed in a bucket of disinfectant and discarded.

Multi stage incubators should be treated with anti-fungal smoke or fog during incubation after cleaning as much as possible. Pay particular attention to fresh air inlets when cleaning.

Single stage incubators are normally thoroughly washed and disinfected every 18 days and should be less vulnerable to long term contamination.

Transfer of eggs to hatcher

Again this should be as gentle as possible. Any egg broken or badly cracked at this time should be discarded. Any eggs contaminated by mould or bacteria should be placed in a bucket of disinfectant and discarded.

If using a vacuum transfer, ensure that the vacuum head and cups are thoroughly washed after use and the entire vacuum system is cleaned at least weekly. Aspergillus will readily grow on egg yolk and blood sucked into vacuum transfers.

In ovo vaccination

If using in ovo vaccination it is imperative that conditions are dust free in the area and that the hatchers are as clean as possible.

The hole in the egg after vaccination can easily be entered by aspergillus spores.

Bad vaccine preparation can also allow spores to enter the egg via the vaccine.

Chick take off and storage

Prior to chick take off, ideally as the last chicks are hatching, it is recommended to use smoke canisters containing Enilconazole in the hatchers. This is perfectly safe and will help to control spores circulating in the chick fluff which is released as part of the natural process of hatching.

During chick take off, try to contain the chick fluff. Keep doors not in use during the hatch closed, to reduce cross contamination from one room to another.

Remember, if you have a positive pressure ventilation system to stop dust back tracking, 'it only works with the doors closed'. Again, while storing chicks prior to delivery/collection, ensure fluff is contained when heavily ventilating this area to keep chicks cool.

Ventilation units

Ideally air entering the hatchery from outside should be filtered to reduce spores entering the hatchery. Remember a filter should be cleaned or replaced regularly. If not, the filter itself can become the breeding ground for fungal problems in the hatchery. All ventilation units, shafts and ducts should be cleaned regularly and treated with smoke canisters containing Enilconazole.

The use of smoke products is recommended in these hard to treat areas.

Pay particular attention to hatcher inlets/exhausts. These are often the worst areas of contamination and often difficult to clean. Often hatcheries are badly designed and allow dirty air from exhausts to be sucked back into the hatchery by badly placed inlets.

The hatchery roof interior can be a breeding ground for spores as dust in this area is hard to control and the area is almost impossible to clean. Fogging with anti-mould solution may be the only option.

Evaporative coolers

If fitted evaporative coolers can be a prime source of contamination as spores and organic debris can be sucked into the pads. Spores then grow on the filter material. If these are turned off at night and dry out, you have the ideal wet-dry cycle required by aspergillus to grow and sporulate and then cause contamination of the air entering the hatchery.

Clean, replace and disinfect these regularly. Ideally install equipment to treat the water in these with the anti-fungal product or treat the systems manually.

Diagnosis of infection

It is recommended that air samples are taken in the hatchery on a weekly basis, using Sabourard agar plates. This is simple, cheap and will give an indication of the number of spores circulating in the hatchery.

Agar plates should be exposed to the air in the area to be sampled for 10 minutes. The sample plate should then be sealed with tape and incubated in one of the setters for 36-48 hours. It should then be possible to

Maintain evaporative coolers.



count the number of mould growths on the plate.

These results should be recorded to enable a graph to be drawn showing increase/decrease of numbers of spores per area. Always sample at the cleanest time, when there is little air disturbance. For example when the hatchery is clean and washed and when staff have left. Always sample the same places, at the same time, on the same day so that comparisons are accurate.

Egg necropsy is another useful tool enabling the hatchery to trace contamination of eggs to a particular flock, incubator or hatcher.

After a hatch, unhatched eggs should be

broken out to ascertain if any have mould growth (normally within the air cell).

Many hatcheries break out unhatched eggs to check if they have any incubation problems and finding a few eggs with mould growths can be an early warning of a major aspergillus problem.

The hatchery is the main proliferation site, distributing chicks to many broiler farms. Ordinary broad spectrum disinfectants will have little effect on aspergillus spores.

Fumigation with formaldehyde is also ineffective. Use of an anti-mould, anti-spore product containing Enilconazole is the only treatment for aspergillus control. Ensure your hatchery is not the link in the breeder chain that breaks! ■