

# Effective aspergillus control in the hatchery

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**A**spergillus is a ubiquitous mould found in hatcheries and poultry farms worldwide. The spores are responsible for the disease 'aspergillosis' with up to 30% mortality in young chicks. No hatchery is free of aspergillus and some geographical areas may see increased concentrations due to seasonal conditions.

Aspergillus requires warmth and humidity for growth, a warm dry environment for sporulation, an organic growth medium and air currents to spread the spores, such as a wet-dry-wet-dry cycle.

Conditions in mainland and South East Asia, where many countries suffer from high humidity and rainy seasons, followed by dry seasons, are ideal for the aspergillus life cycle contributing to the continuous environmental challenges.

## Control is the key

As mentioned before, all hatcheries will have some aspergillus contamination and the key is to control the amount of contamination. It is impossible to remove the problem completely as the hatchery will be under continuous threat from spores arriving with eggs from the supply farms and spores entering the ventilation system.

Eggs arrive at the hatchery having been placed on setter trays at the supply farm or on fibre trays in cardboard boxes for processing onto trays in the hatchery. If they arrive on setter trays it means all quality control is at the farm and often the farm is under pressure to supply as many eggs as possible to the hatchery.

This means grading of eggs is at best minimal and eggs with porous shells or hair-cracks, which may already have been infiltrated by spores, enter the hatchery. If the eggs arrive on fibre trays for processing at the hatchery, grading is better, but there is increased risk of aspergillus contamination from the fibre trays.

Fumigation with formaldehyde is often used either on farm or at the hatchery prior



**Necropsy: egg mould growth.**

to incubation. This has little to no effect on aspergillus spores. If the eggs are on fibre trays in boxes it will have little effect on anything else!

Aspergillus can also grow on damp poultry feed producing the mycotoxin known as aflatoxin. When this food is consumed by breeding birds it may lead to immunosuppression, a drop in egg production and reduced fertility/hatchability. Any hatchery sited near a feed mill should be very vigilant to windborne dust from the mill being drawn into the ventilation systems.

Any dust from agricultural activity and pollen from trees can carry spores into the hatchery but the main contamination of a hatchery will normally be with the eggs arriving from farms.

## The ideal site

In all situations, the hatchery is the main proliferation site as once the spores arrive, the hatchery can supply all of the conditions/nutrients required to enable a spore to grow into a mould and produce thousands of spores of its own, all ready to reproduce again.

The life cycle of spore/mould/producing spores happens in 2-3 days depending on conditions. When spore numbers in a hatchery reach a high it is called a mould 'bloom'. At this point you may well see a drop in hatchability (deaths at about 16 days of incubation), chicks dying in hatcher baskets and high early mortality on the broiler farm. There is no treatment for the condi-

tion, although antibiotics may be used to prevent secondary infections.

Older multi stage hatcheries will generally have more problems than newer single stage hatcheries due to the ability to clean and disinfect the setters every 18 days.

Areas which need to be closely monitored are the ventilation systems, which need to be cleaned regularly. If the air entering the hatchery is filtered, clean and change the filters regularly. Treat the system after cleaning to a specific anti-mould, smoke or fog treatment. The egg storage should be clean and refrigeration/humidifiers should be checked for leaks. Eggs should not be allowed to get wet during storage as during the cooling period the shell contracts, drawing in any spores or bacteria on the shell.

If you see high numbers of eggs affected by mould or pseudomonas, there is a high possibility that this contamination occurred early on the farm or in the egg store due to poor conditions when eggs were cooling. Use a similar treatment in these areas.

## Extraction systems

Extraction of dirty air from hatcher is one of the worst problem areas in a hatchery. Many of the older linked extraction systems, where up to 10 or more hatcher exhausts are connected by a manifold system, can cause cross contamination of hatcher.

These are also almost impossible to clean regularly and, depending on where they exhaust their air outside, can also compromise the incoming air to the hatchery.

This type of system should be treated with a smoke based anti-mould product.

The modern plenum chamber designs, which are easy to clean and do not emit dust outside, are the best. Evaporative cooling systems can be reservoirs of mould. The air entering the wet fibre cooling pads will carry spores and organic material; spores will grow on the pads and will be sucked into the hatchery.

Often the systems will be shut off during the cooler night periods contributing to the wet/dry cycle required for proliferation. Clean or replace regularly and treat cooling water with an anti-mould preparation.

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Positive air pressure systems can be very useful in a hatchery to stop dust getting into clean areas, but remember to keep doors closed, as with doors open the air pressures equalise and dust will backtrack into clean areas. During transfer eggs may be candled, in ovo vaccinated, then transferred using automatic or manual operations. All of these procedures should be done as gently as possible to reduce breakage. If you see small patches of greenish blue mould in the eggs, mainly in the air cell on hatch day necropsies, this is almost certain to be caused by damage/contamination at about 18 days.

Most automatic transfers are heavily contaminated with aspergillus as they suck in

dust from eggs and residue from broken eggs. Aspergillus grows throughout the vacuum system. These machines should be thoroughly dismantled, cleaned and disinfected regularly.

## In ovo vaccination

If undertaking in ovo vaccination, the room should be free of aspergillus contamination as the small injection hole in the egg can easily allow spores to enter. Hatchers should also be spore free. Storage of cardboard boxes/fibre egg trays in the hatchery is also a problem. These will carry farm dust and spores. If these get wet during washing

operations and then dry, you will find mould will grow easily on these materials.

Since these are often multi use, they can then follow a circuit (farm/hatchery/farm) increasing contamination problems.

Often cracked/reject/candled infertile eggs are stored in the hatchery. Where possible, always find a storage area away from the hatchery for these.

Horizontal surfaces in hatcheries will often collect dust in areas which are difficult to clean by hand and dangerous to wash (electricity). These will need more specialised treatment. Hatcheries will have an open roof design (difficult to clean) or a closed roof containing ventilation, humidity and heating, which is also difficult to clean.

Washing is impossible. The problem is often made worse by the setters exhausting dirty stale air into these areas. Vacuuming and fogging with anti-mould preparations are the only treatments here.

Waste storage needs to be situated as far as possible from fresh air inlets and any dust from this should be controlled. In hatcheries with problems, it is often seen adjacent to an evaporative cooler drawing air into the hatchery!

Regular sampling of the hatchery using Sabourard agar plates should be done to establish where problems are located and records should be kept of the colony counts in these areas to follow the reductions/increases in contamination levels.

Egg touch samples will also give an idea of contamination from individual supply flocks. Egg necropsy of unhatched eggs at 21 days incubation will also point to a flock or particular hatcher as being of concern.

## Economic impact

The economic impact of aspergillus includes:

- Increased embryo mortality.
- Early chick mortality (up to 50% in worst cases).
- Weakened viability of chicks, immunosuppression.
- Poor weight gain of broilers.
- Increased mortality during growth period.
- Increased cost to overcome infection.
- Loss of customer confidence in chicks.

Even without clinical symptoms, aspergillus can cause a reduction in the profitability of a flock, as a small not noticeable percentage of chicks may die due to a localised infection, such as chicks that hatch adjacent to an egg releasing spores. Many other chicks in the hatcher may suffer some sub clinical symptoms making them susceptible to secondary infections. Most hatchery disinfectants have very limited action against mould and even less against mould spores.

All hatcheries should include in their regular hygiene procedure, treatment with an anti-mould/anti-spore product containing Enilconazole as this is the most effective anti-fungal compound available. This will increase profitability and protect against the huge cost of a major aspergillus infection. ■