

Preventing Aspergillosis In Commercial Turkeys

Aspergillosis is a fungal infection caused by various species of the mold *aspergillus*. *Aspergillus fumigatus* is the type, which causes the majority of clinical problems such as: pneumonia, airsacculitis, eye infections and death. Occasionally aspergillosis will spread to the brain and birds will show nervous signs. Affected birds have difficulty breathing especially after handling or moving. They are often smaller in size, inactive and will stay close to the barn walls.

On post mortem you may see any of the following⁷:

- Pneumonia with yellow or gray plaques or nodules in the lungs. If the nodules are very small, it may be easier to “feel” them than see them. So careful palpation of the lungs at necropsy may reveal an aspergillosis infection.
- Airsacculitis with fuzzy gray or dark green material in the air sacs. In older birds, the abdominal air sacs may be filled with a yellowish creamy material.
- Nodules or blockages in the trachea at the point where it splits into the 2 major airways to the lungs.
- Gray-white opacities (cloudy areas) within one or both eyes.

Aspergillosis is not infectious. It cannot spread from one bird to another like other disease agents.

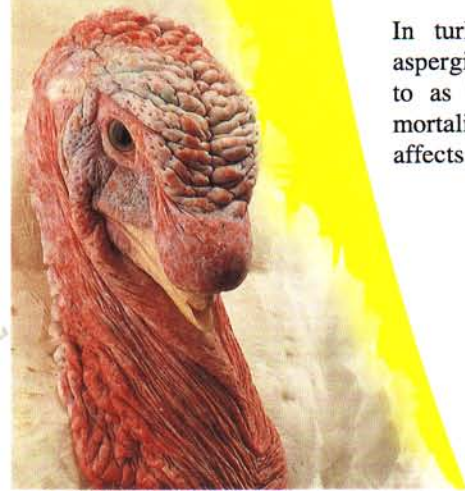
Why Does It Occur?

In turkeys, we see both acute and chronic aspergillosis. Acute aspergillosis is often referred to as “brooder pneumonia” because it causes mortality during the first week and primarily affects the lungs. Poults are exposed to high

levels of aspergillosis spores during hatching or transport to the farm. On post-mortem small white nodules can be seen in the lungs. It is important to send these to a diagnostic laboratory for culturing, as exposure to high levels of bacteria such as *Staphylococcus aureus* in the hatchery can also produce the same type of nodules and mortality. Turkeys do not develop immunity if exposed to aspergillus at a young age. Research has shown that early exposure may actually increase susceptibility to later infection.

Chronic aspergillosis is the term used to describe aspergillosis infection in birds over 4 weeks of age. Heavily contaminated poultry litter, feed or the environment are often the source of aspergillus spores. Outbreaks occur when the organism is present in high numbers and/or when the bird is overly stressed due to poor environmental conditions, poor nutrition, or following a disease challenge which damages the respiratory or immune system. Market age toms are very susceptible to aspergillosis. In addition to testosterone being produced at the onset of sexual maturity so is corticosteroid hormone, which is immunosuppressing.

Aspergillosis related mortality and condemnation at processing can occur at any time of the year. The peak incidence rate in turkeys raised on either the west or east coast of the USA is during the summer due to high dust levels. Dust is an excellent carrier for bacterial and fungal spores. Anytime we cause birds to pant, air bypasses the upper airways where it would normally be filtered. Consequently, inhaled material such as dust, bacterial or fungal spores are deposited directly into the abdominal air sacs and then into the lungs. The air sacs and lungs cannot effectively remove this material. Within the lungs, the turkey will attempt to put a protective wall around the fungal spores to limit the spread. This results in the formation of a nodule



For turkeys, raised in the midwest, the peak incidence is during the winter months, when relative humidity is low and ventilation is minimized to reduce heating costs. Researchers at the University of Minnesota have demonstrated the impact of as little as 10 ppm ammonia on the turkey respiratory tract³. Ammonia directly kills the hair-like structures called cilia which line the trachea. Without the cilia, air-borne dust, bacteria or mold are not trapped and proceed directly to the abdominal air sacs. Indirectly ammonia affects the immune system by reducing the clearance of E. coli from the air sacs, lungs and tracheas of turkeys. In this case, disease occurs because we have both increased the challenge dose the bird is exposed to and simultaneously decreased their resistance. There are many interactions in the environment, which affect the respiratory system. The worst combination appears to be warm temperatures, ammonia levels greater than 20 ppm and dust levels greater than 5 mg/m³. All three of these parameters increase when density increases⁵.

How Do We Prevent Aspergillosis

Ensure that poults come from a hatchery with effective egg and hatchery sanitation and monitoring programs that will help to minimize the occurrence of brooder pneumonia.

The following are recommendations to prevent aspergillosis in older birds :

- Use only dry, clean litter. Shavings should be kiln dried and packaged in paper rather than plastic. If using bulk shavings ensure that they are dry throughout. Remember “getting a deal” because the shavings are a little damp isn’t necessarily a bargain because aspergillosis spores readily grow and thrive due to the additional moisture. Deal with a reputable supplier. Visually inspect each load of shavings prior to spreading it within the barn and periodically monitor levels of mold present in representative litter samples.

- Feed bins should be cleaned between flocks and sanitized when weather permits drying of the bin. Visually inspect the interior of feed bins for evidence of feed buildup and small holes. Feed lines can be cleaned by running corn through which has been saturated with propionic acid or other mold inhibitors.
- Areas around feed pans or drinkers are excellent areas for mold to grow in. Therefore manage drinkers, avoid water spills and if they occur, remove the wet material from the barn. Alternating wet and dry conditions are an ideal situation predisposing for the development of aspergillosis. The fungus multiplies during the wet period producing abundant spores, which then become aerosolized when conditions become dry.
- Optimize air quality.
 - Ensure that the ventilation capacity is adequate for the density of birds present.
 - Reduce the level of dust in the barn has been shown to decrease the incidence of fungal diseases by 75%⁶.
 - Increase ventilation to lower dust and the number of air borne spores but not to the point of drying out the litter or reducing the relative humidity such that more dust rises into the air.
 - Reducing the temperature in the barn increases the relative humidity and increases the weight of the dust particles so they settle out faster, lessening the level within the air⁴.
 - Humidity should be 50 to 60%.
 - Use of coarse sprinklers has shown to be beneficial in reducing the dust level and incidence of aspergillosis without soaking the barn. Adding salt to the drinking water, one day a week to make the droppings wetter has been shown to reduce dust levels¹.
 - Spraying the litter with magnesium chloride between flocks then tilling the litter has been shown to reduce lung and airsac lesions at market and improve plant condemnations².

- Minimize or prevent heat stress. *Refer to the Hybrid Turkeys Info Sheet "Minimizing the Effects of Heat Stress"*.

What Can I Do Now If My Flock Has Aspergillosis ?

In general, an effective and practical means of treatment is not available and consequently prevention is the key. But what do you do when aspergillosis has been diagnosed in a flock?

It is most important to:

- minimize additional stressors on the flock, and;
- maximize the air and environment quality by lowering dust and ammonia levels. Increase

the level of biosecurity and sanitation to minimize the stress of other disease organisms.

The following products have been applied on litter or under feed lines and around drinkers to help control aspergillosis :

- copper sulfate and nystatin
- thiabendazole
- Clinafarm® (Imazalil) is a specific antifungal agent (approved in Europe and Latin America) for litter treatment. It can be highly effective against fungal organisms and spores.

Birds with aspergillosis can ward off the infection if it is not too severe and if stress is minimized and environmental quality maximized.

References

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