

Ventilation for the Poultry Flock

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While many small flock owners allow their birds access to the outdoors, ventilation in the coop area is critical when it comes to the health of the flock. Weather extremes, both hot and cold, along with rapidly changing conditions during certain months pose a challenge to providing adequate ventilation for the flock.

In colder months of the year, the main challenge is the ability to provide ventilation while maintaining heat within the enclosure. This is especially true for young birds in colder months. In warmer months, allowing heat from the inside of the enclosure to escape is the main issue.

No matter the time of year, or the temperature outside, the main goal of ventilation is the exchange of air between the outside environment and the inside environment. Ventilation is needed for many reasons, including: removal of dust, moisture, and excess heat, along with providing fresh air that is high in oxygen. A ventilation system should also be able to distribute the fresh air equally and uniformly throughout the enclosure and it should do this while controlling the speed of the air. Drafts, especially during cold weather and with young birds can be a significant issue. Uniform distribution is also essential during periods of hot weather so that areas low to the ground (where the birds are) are not significantly warmer than other areas of the coop.

Moisture is another area of concern when it comes to ventilation. Animals, chickens included, produce moisture as a by-product of life. While some of this moisture is expelled in the waste of the animal, much of it is expelled via respiration. In an enclosed space, this exhaled moisture can lead to an increase in the relative humidity of the area and can cause issues. Humid air is more likely to condense during cooler periods. This is why we have a heavier dew on cooler mornings here in the South. This condensed moisture can lead to problems with wet litter. It is recommended that the relative humidity of the enclosure be no more than 70%, although this percentage may be tough to reach for naturally ventilated houses here in humid Florida.

Finally, poor ventilation can cause a buildup of both ammonia and carbon dioxide within the enclosure. Both of these gases can cause issues with flock health and performance. High carbon dioxide levels decrease performance as the birds have to work harder to get the required oxygen into their systems. Ammonia buildup within the air can cause respiratory irritation that can eventually lead to respiratory distress and possible infections.

Additional information on ventilation for poultry can be found at the [Auburn University Poultry Ventilation and Housing Site](#) and [The Poultry Site](#).

A University of Florida Digital Library publication on Toxins and Poultry can be found [here](#).



Showy Crotonia (*Crotalaria spectabilis*) can be toxic to poultry. Image source can be found [here](#).

Reference materials for poultry ventilation can be found [here](#) and [here](#).

Toxins and Pastured Poultry

Over time, many plants have evolved defenses against being eaten by herbivorous animals. These include thorns, spines, and other physical defenses. However, certain plants also have the ability to produce chemicals that can cause harmful effects when they are inhaled, ingested, injected, or absorbed. While poultry do not typically come into contact with many of these plants like grazing animals do, it is important to remember that there are toxic plants out there. Remember that feeding your birds trimmings of plants or scraps is not recommended. They should be fed a complete ration that contains all of the nutrients that they need for growth and production.

Additionally, there are many microorganisms that produce substances that can cause injury to animals when they are introduced into the body. As a group, we refer to these naturally-made substances as toxins. Toxins are typically dose-specific. This means that smaller amounts of the toxin may cause mild symptoms, while larger amounts cause more deleterious effects.

MYCOTOXINS—Mycotoxins are probably the most important toxin when it comes to poultry. Mycotoxins are produced by fungi on grains during growth or storage. A common mycotoxin that many people have heard of is ergot, while the most common mycotoxin to affect poultry is aflatoxin. Treatment of mycotoxicosis involves the removal of the feed that contains the mycotoxins and replacement by non-contaminated feed. Additionally, supplementation of vitamins, minerals, extra protein and extra fats may help. Prevention of mycotoxicosis is focused on prevention of formation of the mycotoxins in the feed during growth and storage of grain that is used to produce the feed for the flock.

AFLATOXIN—Aflatoxins are secondary metabolites produced mainly by the *Aspergillus flavus* mold, although other molds such as *Aspergillus parasiticus* have been implicated. In poultry, these toxins will primarily affect the liver but can affect other organs and systems as well. Aflatoxin ingestion can cause mild symptoms such as general unthriftiness, but can also cause fairly high morbidity and mortality. Lesions from aflatoxicosis are mainly found on the liver and can include reddened areas, yellow color (due to fat accumulation), gray or pale color, and atrophy of the liver.

FUSARIUM TOXICOSIS—There are many members of the genus *Fusarium* that can produce mycotoxins that affect poultry. These mycotoxins are considered caustic, which means that they can burn or erode the contact surface, in this case, the digestive system. Symptoms include ulcers or reddened areas of the oral cavity and GI tract, and can include liver damage and bone marrow damage.

OCHRATOXINS—Ochratoxins are produced by members of the *Penicillium* and *Aspergillus* genera. Ingestion of ochratoxin generally results in renal (kidney) disease, but can also affect the immune system, bone marrow, and liver. Additional symptoms of severe intoxication include, diarrhea, huddling, hypothermia, and rapid weight loss. Mild intoxication can affect weight gain, carcass yield, egg production, fertility, and hatchability.

ERGOT TOXIN—Ingestion of toxic alkaloids produced by members of the *Claviceps* genus are often referred to ergot poisoning. These fungi most commonly are associated with rye, but can also be found on other cereal grains such as wheat. Ingestion of the ergot toxin affects the nervous system of the animal, often causing

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convulsions. Ergot also affects the circulatory system, causing constriction of blood vessels in the extremities, thus leading to gangrene. In young chicks, the discoloration from vasoconstriction is usually seen in the toes, while in older birds, the discoloration and gangrene is usually seen in the comb, face, and wattles.

TOXICITY OF COMMON WEED SEEDS—

While most poultry do not consume plants in the way that herbivores such as cattle do, they can still be exposed to harmful or toxic plants. This commonly happens when poultry are exposed to the seeds of toxic plants, rather than the foliage. The following plant seeds have been shown to be toxic to many animals, including poultry.

SHOWY CROTALARIA—While many species of crotalaria are toxic to animals, *Crotalaria spectabilis*, also known as showy crotalaria or rattlebox is typically the most harmful to poultry. The toxin produced by this plant is monocrotaline and is found in the greatest concentration in the seeds. Laying hens that have consumed crotalaria seeds exhibited a sharp decrease in egg production and increased mortality. The toxin can cause rupturing of the liver and internal hemorrhaging. There is no successful treatment reported for crotalaria poisoning.

SICKLEPOD—*Cassia obtusifolia*, commonly known as sicklepod or coffeeweed is a common weed in the southeastern U.S. It is believed that anthraquinones are the toxic compounds produced by this plant. Reduction in feed intake is the main reaction seen from ingestion of this plant or its seeds.

COFFEE SENNA—*Cassia occidentalis*, commonly known as coffee senna is

very similar to sicklepod. The leaflets on this plant are more pointed and more numerous than sicklepod, and the coffee senna plant has flattened seed pods and seeds. Many toxic compounds have been recovered from seeds of this plant. Symptoms of intoxication by coffee senna include: weight loss, weakness, diarrhea, and hypothermia.

SESBANIA—*Sesbania macrocarpa*, is a tall shrub that is native to Mexico, but now appears throughout the southern U.S. The seed pods of this plant are cylindrical and curved, and the flowers are yellow. The seeds themselves are dark brown and resemble small capsules. Saponin, which is a bitter-tasting glycoside has been reported as the main toxic component of sesbania. Symptoms of poisoning with this plant include: weakness, diarrhea, depression, and rapid weight loss.

JIMSONWEED—*Datura stramonium* is a summer annual that can grow between 2 and 5 feet tall. Seeds of this plant are dark brown in color and have a rough outer seed coat. These seeds contain alkaloids, which can cause toxicity in chickens. Signs and symptoms of intoxication by jimsonweed include abnormal contraction of the pupils, excitability in the birds, muscle tremors, nervousness, and sudden death. Long-term ingestion at low levels has also indicated a reduction in performance.

As a flock owner/manager, it is important to know the possible signs/symptoms of intoxication by fungal toxins and plants. You should always be wary of feed that has mold growth. If your birds are allowed to range, you should scout the area and make sure no toxic plants are available for consumption.



Seeds of Showy Crotalaria (*Crotalaria spectabilis*) can be toxic to poultry, if consumed. Image source can be found [here](#).



Sicklepod (*Cassia obtusifolia*) plants can be toxic to poultry. Image source can be found [here](#).



Sicklepod (*Cassia obtusifolia*) seeds can be toxic to poultry. Image source can be found [here](#).

Cannibalism in the Backyard Flock

Cannibalism in the poultry flock can occur in any age group and with any breed. Birds can cause injury to each other by picking at feathers, toes, and other areas. Individuals within a flock will naturally mimic or imitate each other, so it is possible that a imitation of cannibalistic tendencies can spread rapidly through a flock. It is important to monitor your flock closely for signs of cannibalism, as losses from injury and death can be high. Cannibalism can be influenced by the following factors:

Overcrowding—If birds do not have enough individual space to eat, drink, and nest, there may be competition for feed, water, and space. Birds that are lower in the pecking order may be excluded or limited in these activities. This can definitely lower performance of the flock.

Overheating—Overheating of the flock can be caused by overcrowding or poor ventilation (see page 1). Birds that are stressed from heat are prone to pecking. Make sure to provide adequate space, ventilation, and water for the flock.

Excessive Lighting—Excessive lighting can be hard to control in a naturally lit house. Natural day length does not typically pose an issue; however, additional light after the sun has set can be a problem. This can be as simple as a garage or street light that shines down on the housing area. Also, if you are providing additional lighting during the cooler months, make sure that it is not too intense. Don't use a 100-watt bulb when a 40-watt bulb will do. The rule of thumb for supplemental lighting is if you can read by it, then the light is bright enough.

Co-mingling of Birds—Combining birds that are different ages, colors, or breeds if they have not been reared together will upset the social order of the flock. This can increase the chance that cannibalism will take place. Avoid mixing breeds and ages, if possible.

Poor Nutrition—Poor or unbalanced nutrition is one of the main reasons for cannibalism. Birds may peck at other birds for feathers (a protein source) if their nutrition is poor or unbalanced. It is recommended to feed a balanced ration that contains all of the nutrients that the flock needs. Poor nutrition can also stem from overcrowding, as birds may not have ample time/space to obtain the nutrition that is needed.

Additional information about cannibalism can be found by consulting the eXtension website, located [here](#).



Coffee Senna (*Cassia occidentalis*) can be toxic to poultry if consumed. Image source can be found [here](#).



Coffee Senna seeds (*Cassia occidentalis*) can be toxic to poultry if consumed. Image source can be found [here](#).

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