

A Question of Lead

Is it harmful to eat eggs from backyard chickens that have been exposed to lead?

One of the primary reasons people keep chickens is the sense of satisfaction associated with raising food. The comfort of knowing where and how our chickens are raised makes us feel secure about the quality of food we are consuming, be it meat or eggs. However, just because we see our chickens everyday doesn't mean that we see all the hazardous materials to which they are exposed.

A rise in urban and suburban backyard chicken-keeping increases the potential for chickens to be exposed to lead-based paints in housing or bedding or from contaminated soil. Furthermore, backyard chicken-keepers could then be exposed by consuming eggs from contaminated family-owned flocks. Of specific concern is the effect on young children who are particularly susceptible to the acute and chronic

effects of lead poisoning. Repeated trace exposures from the environment or food can result in intellectual impairment and delayed neuro-development.

Lead Exposure

Although eggs bought in the supermarket are known to contain negligible amounts of lead, this may not be the case in eggs collected from backyard poultry. Lead comes from many diverse sources in the environment, including discarded manufactured materials, such as lead shot (see image on page 36), batteries, oil, gasoline, crank cases and in-use manufactured items, such as lead-containing paints, chips and wood. In addition, variable amounts of lead are present in the air, soil, water and food (from contaminated feed, meat or animal products or



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canned foods). Even with the decrease in manufactured items produced with lead, contaminants persist in the landscape and may enter the food supply through animal products. Thus, it becomes particularly important for owners of small backyard flocks to be aware of the potential risks associated with the consumption of lead-contaminated eggs or meat.

Owners need to be able to recognize the clinical signs (symptoms) of affected animals and consult with a veterinarian if lead exposure or poisoning is suspected. Clinical signs of acute lead poisoning in chickens include muscle weakness, ataxia (uncoordinated muscle movements), loss of appetite, marked weight loss and eventual drop in egg production.

Chronic exposures may also result in the destruction of certain nerves, leading to muscle loss and causing the animal to have trouble moving about. Even trace levels of lead in a chicken's diet (1.0 mg/kg) can result in growth retardation. After chickens ingest lead, it first enters the bloodstream before it is deposited in bone, soft tissues and eggs. If you suspect that your chickens have been exposed to lead, contact your veterinarian, your state poultry extension veterinarian or an animal diagnostic laboratory.

Get the Lead Out

The highest concentrations of lead are usually found in the liver and kidneys. Interestingly, the U.S. Food and Drug Administration has not

established regulatory limits for concentrations of trace metals in edible tissues of livestock and poultry, with the exception of arsenic, which has been monitored by the Food Safety and Inspection Service of the U.S. Department of Agriculture since the 1970s.

In recent years, veterinary diagnostic laboratories have noticed an increase in the number of lead poisonings in backyard poultry. In many instances, the lead found in tissues during the diagnostic workups was incidental, and lead poisoning was not the cause for overt disease or death in the animal. These so-called subclinical, "hidden" lead exposures may be severely underdiagnosed in family-owned and small commercial operations, and precautionary measures are advisable.

If there is any concern of lead poisoning in a backyard chicken flock, whole blood and eggs should be submitted to a diagnostic laboratory for analysis. If exposure to lead is identified in a flock, every effort must be made to identify the source of contamination in the environment. Submission of appropriate samples (such as soil, water, feed, wood chips) and a thorough scouring of the environment for manmade sources will help in source identification.

Unfortunately, many consumers believe that lead levels resulting from environmental exposure do not pose a serious health threat. As backyard chicken ownership becomes more popular, it is important to heighten public awareness about health risks, testing options and management prevention considerations. In addition, other animals besides backyard chickens can be exposed to similar shavings and chips (dogs, goats, etc.), and the problem may be more widespread than suspected.

Human Health Concerns

The current threshold of lead consumed per day from all dietary sources should not exceed 6.0 µg, which is particularly important for children less than 6 years of age and pregnant women. Eggs of chickens exposed to lead have been found to contain lead in levels close to this amount. In fact, consumption of a single, average 60-gram egg may result in exceeding this recommended daily threshold. More importantly, lead can accumulate, and the consumption of lead-con-

This is a 20-week-old chicken's gizzard/stomach containing shell casings. The chicken died from lead poisoning.



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MARIA DRYFHOUT/SHUTTERSTOCK

taminated eggs over time can lead to increased risk for disease, especially in the most susceptible groups, children and pregnant women. Thus, it is recommended that chicken keepers periodically assess the lead concentrations in eggs of family-owned flocks. As mentioned earlier, your veterinarian, state poultry extension veterinarian or animal diagnostic laboratory should be able to help you find an appropriate laboratory for testing.

Specific management recommendations in cases of lead identification in your flock include

removal of all lead-based materials, elevation of coops above the ground to minimize contamination from soil and the avoidance of using chicken eggshells in compost because of the potential to re-contaminate the hens or other food sources. The contamination of chickens or eggs suggests a potential source in the environment to which children could have direct access, as well.

Finally, any chicken presenting illness should undergo a heavy-metal screen regardless of clinical signs or primary diagnosis. Anyone concerned about acute or chronic lead exposure from animal products should contact the local health department or physician about testing their blood levels, most particularly in children and pregnant women. In addition, testing of eggs and blood levels in animals is readily done at many animal science programs and veterinary institutions. ☼

Young children and pregnant women are more susceptible to lead poisoning.

Find Out More

Check out these news articles for more about lead and backyard chickens:

"High Lead Found in City-Sourced Eggs,"

New York Times, by Julie Scelfo: www.nytimes.com/2012/10/10/dining/worries-about-lead-for-new-yorks-garden-fresh-eggs.html

"High lead levels an issue for backyard chickens, soil," *Berkeleyside*, by Mary Flaherty: www.berkeleyside.com/2013/09/06/high-levels-of-lead-is-an-issue-for-backyard-chickens-soil

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