

Lead Contamination in Backyard Chickens

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In the Literature

Sobhakumari A, Hargrave SA, Hill AE, Poppenga RH. Lead contamination in backyard chicken layer flocks in California. *J Vet Diagn Invest.* 2019;31(3):359-363.

FROM THE PAGE ...

Raising backyard chickens for eggs has grown in popularity as humans look for healthier, safer, local alternatives to commercially produced eggs; however, rearing chickens carries some zoonotic concerns¹ and potential risk for the birds being exposed to chemicals or heavy metals (eg, lead) and passing these on to consumers through eggs or meat.² Birds may pick up lead from various sources (eg, contaminated water and feed), but the main source of lead exposure for backyard poultry is likely contaminated soil. Soil can be tainted by flakes of lead-based paint, which was banned in 1978,³ from older buildings^{2,4} and can even be contaminated residually after shooting activities.²

This study looked at the risks for lead exposure in backyard chickens in California, subsequent lead contamination in eggs, and the risks to human health from lead-positive egg consumption.² Over a 1-year period, liver lead concentrations were measured from chickens submitted for postmortem examination. Of the 1476 livers tested, 3.05% were positive for lead, of which 22% had toxic exposures. Most positive cases had lived in urban areas ($n = 18$); fewer cases came from the suburbs ($n = 11$) and rural areas ($n = 11$). At the highest lead concentrations detected, one egg would contain more than double the recommended provisional tolerable daily intake of lead allowed in children younger than 6 years. Frequent exposure at this level in children can lead to behavior disorders, attention-deficit/hyperactivity disorders, decreased brain volume, and/or IQ deficits.² Even at low levels, repeated consumption poses a risk. Lead was found in all soil samples tested and, at one home, was found in chicken feed, paint chips, and blood from other chickens in the flock.

Clinical signs of lead toxicosis in chickens are not well-described, making early diagnosis challenging. Most chickens in this study did not have clinical signs or postmortem lesions suggesting lead intoxication; only 3 of the 45 that tested positive for lead had neurologic signs (eg, head wobbling, incoordination, swollen crop, inability to walk). Chickens that test positive for lead pose a risk to humans in the home, as humans may be exposed to the same primary source of lead contamination in addition to lead in the eggs.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** Owners of backyard chickens should be educated about potential sources of lead exposure for their chickens, particularly the threat posed by paint on older buildings on the premises.
- 2** Owners should be encouraged to test their soil and other environmental samples for lead prior to obtaining birds.
- 3** Owners should consider periodic monitoring of lead levels in their birds and eggs.
- 4** The lack of characteristic clinical signs or postmortem lesions in chickens with lead toxicosis presents a significant challenge for early detection and diagnosis in the absence of routine lead screening.

References

1. Pohjola L, Nykäsenoja S, Kivistö R, et al. Zoonotic public health hazards in backyard chickens. *Zoonoses Public Health.* 2016;63(5):420-430.
2. Sobhakumari A, Hargrave SA, Hill AE, Poppenga RH. Lead contamination in backyard chicken layer flocks in California. *J Vet Diagn Invest.* 2019;31(3):359-363.
3. United States Environmental Protection Agency. Protect your family from exposures to lead. EPA website. <https://www.epa.gov/lead/protect-your-family-exposures-lead#sl-home>. Updated March 26, 2019. Accessed May 22, 2019.
4. Bautista AC, Puschner B, Poppenga RH. Lead exposure from backyard chicken eggs: a public health risk? *J Med Toxicol.* 2014;10(3):311-315.