



# Environmental Public Health Tracking

USING EPHT DATA AND RESOURCES TO MAKE A DIFFERENCE

## Lead in free range chicken eggs investigation

### What was the problem/situation?

A resident living in Washington County, Missouri, called with concerns about the possibility of lead in free-range chicken eggs. The yard had been sampled for lead contamination and the previous resident left paperwork received from United States Environmental Protection Agency (EPA) indicating the lead levels in the yard are elevated enough to be eligible for replacement. Her husband has refused to allow EPA to replace the soil. The resident is concerned because they have approximately 20 free-range chickens that eat in the yard. The family eats eggs from these chickens. The resident wanted to have the eggs tested for lead.

### How was Tracking involved?

EPHT convened a work group of several programs within the Bureau of Environmental Epidemiology to address this concern. First, EPHT staff consulted with the Missouri State Public Health Laboratory (MSPHL) about lead testing in food (specifically eggs). The MSPHL had the capability to test the eggs, but suggested testing blood from the chickens first, since that was a simpler test to run. EPHT staff worked with the resident to obtain blood samples from the chickens. Three samples were submitted by a veterinarian and all three contained lead. There are no standards for lead in fowl, but, by human standards, all three birds had elevated blood lead levels.

Next, EPHT staff collected some eggs from the resident for analysis. EPHT staff made recommendations to the resident at the time of egg collection that the chickens should be fed from a pan not the ground and that crushed egg shells should not be fed to them at all. The yolks of all the eggs sampled contained lead, as well as the whites in half of the eggs. EPHT staff decided to collect additional eggs from the resident, as well as some comparison eggs from a couple of people residing outside of Washington County and with no known lead contamination in the soil. EPHT partnered with Childhood Lead Poisoning Prevention Program (CLPPP) staff to collect soil samples at the two comparison houses.

Egg samples showed all the eggs from the Washington County location contained lead in the yolk but only two eggs contained lead in the white. Two of the comparison eggs



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also contained lead in the yolk, but at much lower levels than the Washington County eggs. Soil sample results showed no lead in the soil at the two comparison locations.

EPHT staff also partnered with Health and Risk Assessment Program (HRAP) staff to determine what reference standard to use in evaluating the sample results. The closest reference level we found to compare the lead in eggs to was the World Health Organization's (WHO) level of 0.1 parts per million (ppm) of lead in poultry. This reference does not mention eggs specifically, but, because eggs are a poultry product, we thought it was the most appropriate level to use. The WHO level is the maximum concentration recommended to be legally permitted. It is not a consumption level and does not mean poultry with higher levels cannot be consumed.

## What action was taken to resolve the problem?

A letter was sent to the resident explaining the potential for lead exposure from eating egg whites, egg yolks and whole eggs. It included a recommendation to consider serving fewer egg yolks, especially to young children. Additional recommendations, listed below, were included to reduce their exposure to lead.

1. Have the soil in your yard remediated.
2. Remove dust/dirt from eggshells before preparing eggs.
3. Do not feed the chickens or other animals on bare ground. Always place feed in a pan.
4. Use raised beds or containers for gardening.
5. Give household pets, especially dogs, frequent baths to remove dust/dirt that may contain lead.

This investigation greatly contributed to the scientific knowledge base, as the Missouri CLPPP and HRAP programs now consider free-range chickens and eggs as potential sources of exposure when conducting environmental risk assessments for elevated blood lead investigations and at lead contaminated sites. The regional ATSDR office is interested in this investigation and would like to see additional work done to determine if this is an isolated incident or if it occurs routinely. EPHT staff has suggested the idea as a research topic for environmental students at Missouri State University.



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