Understanding the Effects of Fire on Eggs from Backyard Poultry

&

Update on virulent Newcastle Disease in Poultry

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Questions?
We are no longer accepting submissions for our backyard egg study.

The University of California’s Cooperative Extension Poultry program provides free egg consultation training for backyard chicken layers in the state of California. Backyard chicken layers are an important part of the state’s agricultural economy, and UCCE Poultry provides educational resources to help backyard chicken layers improve their egg production and management practices.

Submit your egg samples to the UCCE Poultry program for free consultation and receive a detailed report on your egg production and management practices.

For more information, please visit our website at www.ucce.ucdavis.edu/poultry.

Also available in Spanish!
Over 400+ backyards are affected in Southern California

New case in Alameda Co.

Previously also spread to Utah & Arizona

In BY, fighting and commercial poultry

IF you have sick birds call:

- California Sick Bird Hotline at 866-922-BIRD (2473)
- CAHFS Diagnostic Lab ($20 for up to 2 birds full necropsy)
- Cooperative Extension
Virulent Newcastle Disease: The Basics

- 2-15 day incubation period
- Almost all (domestic and wild) are susceptible
- Transmission via fomites, aerosol, feces and contact with infected birds (aka proximity to infected premises)
- Clinical signs:
  - Drop in egg production
  - Respiratory signs: Coughing, sneezing, tracheal rales
  - Neuro signs: circling, spasms, tremors
  - GI: Diarrhea
- Virus is sensitive to light and disinfectants
- Mild conjunctivitis in humans
How do you Control a Highly Infectious Poultry Disease in a Urban Area?

- Education
- Communication
- Quarantine
- Vaccination
- Depopulation
Smoke Carries Chemicals

“Smoke” Measured as Particulate Matter (PM) Carries Other Chemicals

PM2.5 Concentrations
Micrograms per cubic meter

PM2.5

Latitude (N)
Longitude (W)
Question: Are eggs from backyard chickens raised in close proximity to fire a public health issue?
Toxins we tested for

**Heavy metals**
- Can exist naturally in soil but can also be emitted in toxic levels from industrial activities
- Can be present in smoke from burning buildings and cars
- Can be carcinogenic, toxic to many organ systems, and cause developmental effects on fetuses and children

**Polycyclic Aromatic Hydrocarbons (PAHs)**
- Come from the combustion of organic materials
- Traffic-related air pollution is a common source. They also enter the diet through grilling, drying, and smoking foods
- Generally have a lower degree of concern about acute toxicity in humans with more know about their chronic effects (cancer)
- Can impact brain development in fetuses and children
Toxins we tested for cont...

**Dioxins and Furans**
- Industrial byproducts & produced by combustion (eg. waste & fuel burning, wildfire)
- Toxic effects include immune toxicity, developmental & hormonal effects, cancer

**Polychlorinated biphenyls (PCBs)**
- Produced & used as lubricants & coolants in electronic devices until 1977
- Can be released into the environment by the combustion of old products
- Associated with neurodevelopmental & hormone disruption, liver cancer

**Polybrominated diphenyl ethers (PBDEs)**
- Produced & used as flame retardants in foam filled furniture, plastics, & electronic devices. In California, two major classes banned in 2006, all phased out by 2013
- Released into the environment by breakdown & combustion of household products causing soil contamination
- Associated with developmental & neurobehavioral changes & reproductive harm
What is “Unsafe?”

Prop 65/OEHHA
This Product May Contain A Chemical Known To The State Of California To Cause Cancer Or Birth Defects Or Other Reproductive Harm.

CDC

FDA

EPA

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<th>Mean lead values per average sized egg (micrograms)</th>
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Wildfires 2017
Where did the eggs come from?
• 344 premises across CA
• Average of 5 eggs per premise
• Collected during the first 4 months of 2018
So what did we find?
A quick guide to interpreting lead results

Mean lead values per average sized egg (micrograms)

- 0-1
- >1-3
- >3-6
- >6-12
- >12-28

FDA Child Threshold

FDA Adult Threshold

Wildfires 2017
Highest values:
- Stockton (28ug)
- Alameda (22ug)
- Los Angeles (19ug)
- Yolo (18ug)
So how many properties had a problem?
Mean lead values per premise

non-commercial residences only

Highest values:
- Stockton (28ug)
- Alameda (22ug)
- Los Angeles (19ug)
- Yolo (18ug)
Mean lead values per premise

non-commercial residences only (Sonoma county highlighted)

Amount of lead (micrograms) in an average sized egg

FDA Adult Threshold
FDA Child Threshold

Wildfires 2017

Mean lead values per average sized egg (micrograms)
- 0-1
- >1-3
- >3-6
- >6-12
- >12-28
Mean lead values per premise

non-commercial residences only (Napa county highlighted)

Mean lead values per average sized egg (micrograms)
- 0-1
- >1-3
- >3-6
- >6-12
- >12-28
- Wildfires 2017

Amount of lead (micrograms) in an average sized egg
Mean lead values per premise
non-commercial residences only (Butte county highlighted)

Mean lead values per average sized egg (micrograms)
- 0-1
- >1-3
- >3-6
- >6-12
- >12-28
- Wildfires 2017

Number of premises

Amount of lead (micrograms) in an average sized egg
So which counties had the biggest problem?
What about the other toxins?

Other Heavy Metals:
- 2/344 (0.5%) premises had a concerning Mercury level
- 2/344 (0.5%) premises had a concerning Cadmium level
- PCB/PBDE/PAH initial results are being interpreted
  - Interpretation is difficult due to lack of pre-existing studies
So, is it safe to eat the eggs?!

1. A low percentage of eggs from backyard poultry show cause for concern, especially in children.

2. As of today, that concern is not wildfire related - it’s a general concern
So, is it safe to eat the eggs?!

How can I figure out my family’s personal risk from backyard eggs?

Know what’s in your eggs - get them (re)tested at the CAHFS lab

Determine how often the members of your household eat the eggs
How to reduce risk - backyard eggs

Use feeders for all types of feed, including scraps!

Limit contact of hens with high risk areas of yard

Consider supplementing with calcium - but not too much!

Know what you’re being exposed to (so repetitive!)
Next steps for the egg study

Complete the testing for organic pollutants in eggs

Site survey of premises with high lead levels in eggs

Controlled withdrawal study of lead and PBDEs
Questions?

Chicken Lifestyle

Input

Output

Kaput
Thank you to all those who have participated by sending in their chicken eggs or helping to get people involved!!!