

Backyard Livestock and Peri-Urban Agriculture

The urbanization of society has long since pushed people far away from producing their own agricultural products and into relying on imported goods from rural areas. However, there is an increasing trend in recent years to have livestock and poultry in urban and peri-urban areas for reasons such as producing their own food for both themselves and the community as well as keeping farm animals as pets. Knowledge on caring for farm animals is often not as intuitive and requires specific hus-

bandry knowledge versus companion animals like cats and dogs. There are risks of disease transmission from animals to humans, called zoonoses, that can spread from animal to farmer as well as community during contact with backyard farm animals. For that reason, it is important to understand those risks and have easy access to resources that can assist owners in good husbandry practices and prevent spread of diseases between animals and people.



Picture of a backyard goat. Good biosecurity practices help keep backyard livestock healthy.

How I can keep my animals healthy? The first step to maintaining healthy animals is to practice good biosecurity and hygiene practices. This includes purchasing new animals from certified sources and knowing the herd/flock status of the sources and health status. Another important practice the separation of the new animals and your current ones, there would ideally be a 14-30 day isolation period in order to prevent the transmission of diseases between resident animals and new animals. It is recommended to make sure livestock have regular vaccinations, routine veterinary care, and are closely monitored by owners for signs of illness. If signs of illness are detected, the separation of healthy animals from sick animals is crucial in stopping the further spread of diseases.

Having good biosecurity practices are crucial to maintaining healthy animals, not only by introducing new animals but also to prevent the transmission of disease between animals on the farm/herd, wildlife animals, and avoiding the contamination of the environment. Environment such as soil, facilities, and fomites (inanimate objects to carry a pathogen from one susceptible animal to another) can be a

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source of harmful bacteria and viruses. Cleaning a good hygiene of animal facilities and equipment is also necessary for preventing the inception of disease and possible spread.

What practices can improve on small-scale and backyard livestock and poultry? In a recent 2019 study conducted by Pires and colleagues (2019) in four western states in the US, 83.8% of small-scale and backyard livestock and poultry owners reported that they isolated sick animals from healthy ones and 76.6% kept newly purchased animals in quarantine. Other biosecurity practices were reported at a lower rate, such as the quarantine of returning (e.g., from fairs, shows) animals (49%), rodent/pest control (57.3%), wearing dedicated clothes when handling sick animals (49.5%), avoiding livestock contact with wildlife (50.7%) or limiting visitors (22.5%) (Pires et al, 2018).

Where to find information? Veterinarians that specialize in animal husbandry, urban agriculture, poultry, and livestock are often found in rural areas and may not be accessible. Ultimately, it is the responsibility of the owners to provide good care of their animals and seek reputable information sources, in order to keep both humans and animals healthy. The University of California Agriculture and Natural Resources, University of California School of Veterinary Medicine are great resources for backyard livestock and poultry owners maintaining a healthy backyard farm. Several resources can be found at the [Small Scale & Urban Agriculture](#) UC ANR, the [Urban Agriculture](#) UC ANR, and the [Poultry](#) CE webpages.

Summary. Backyard livestock and poultry owners should do their best to prevent contamination and disease spread. Purchasing

the animals from reputable sources, maintaining a clean space for the animals, separating sick from health animals and proper sanitation efforts all play a collaborative part in the prevention of diseases and promotion of animal health, owner and public health. Many sources such as published through different outreach outlets and are available online as well as veterinarians exist for how to properly maintain a backyard farm and what precautions to take. It is important that backyard owners be aware and utilize the information out there and do what is best for themselves as well as the population. For more information, come back for more as this is the first of a series of articles that will cover backyard livestock and poultry.

Nicholas Justin La and Olivia Thorn, Pires Lab, Vet Med Extension
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1. Pires, Alda F. A., et al. "Assessment of Veterinarians' Engagement with Backyard Poultry and Small-Scale Livestock Operations in Four Western States." *Journal of the American Veterinary Medical Association*, vol. 257, no. 2, 2020, pp. 196–209., doi:10.2460/javma.257.2.196.
2. Pires, Alda F. A., et al. "Small-Scale and Backyard Livestock Owners Needs Assessment in the Western United States." *Plos One*, vol. 14, no. 2, 2019, doi:10.1371/journal.pone.0212372.

Calf and Herd-Level Passive Immunity: New Industry Guidelines

Calves are born without maternal immunity as immunoglobulins (IgG) cannot be transferred from the dam to the fetus through the bovine placenta. Thus, providing newborn calves with adequate IgG supply from colostrum is considered an essential management practice. For decades, industry guidelines defined failed transfer of passive immunity (FTPI) as when calves were unable to reach serum IgG concentrations above 10 g/L within the first 2 d of life. Calves with FTPI are not only at a greater risk of illness and death during the pre-weaning period, but they will also have lower feed efficiency and milk yield when they become mature dams.



Dairy producers are encouraged to evaluate their calves' TPI using the new proposed guidelines. Herds that fail to achieve >40% of the calves with excellent TPI should re-evaluate their colostrum management practices.

Over the last decades improvements in colostrum management practices have driven down FTPI (< 10 g/L of IgG) from 41% to 13% (1991 to 2014). Accordingly, from the mid-90's to 2018 preweaned calf deaths have decreased from 11% to 6%, but the proportion of illness remains relatively unchanged from 36% to 33%. The lack of improvements in the number of calves with preweaned illness has raised questions about the adequacy of using 10 g/L of blood IgG as a threshold to define FTPI.

in calves. After some deliberations, this group proposed 4 categories of transfer passive immunity (TPI; poor, fair, good, excellent) and set herd goals of < 10% for poor TPI (< 10 IgG g/L) and > 40% for excellent TPI (≥ 25 IgG g/L). The new categories of TPI were defined

In 2018, a group of experts started working together to re-evaluate the definition of FTPI

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TPI category	IgG (g/L)	TP (g/dL)	Brix (%)	Herd-Level Distribution	Illness (%)	Deaths (%)
Poor	<10.0	<5.1	<8.1	<10%	46.1	7.4
Fair	10.0 - 17.9	5.1 - 5.7	8.1 - 8.8	20%	36.1	3.8
Good	18.0 - 24.9	5.8 - 6.1	8.9 - 9.3	30%	34.8	1.5
Excellent	≥ 25	≥ 6.2	≥ 9.4	>40%	28.5	2.5

Table 1. New industry guidelines for transfer passive immunity (TPI) in newborn calves aged >24 h to 7 d. Reported illness and death using the new TPI categories (n = 2,360 calves, 103 herds).

Calf and Herd-Level Passive Immunity: New Industry Guidelines cont.

considering their practical application on-farm and if they were achievable. Once these categories were defined, this group of experts evaluated them using National Animal Health Monitoring System data that included IgG measurements (>24 h to 7 d of age) and preweaned illness and death records from 2,360 calves housed on 103 US operations (Table 1). As shown in Table 1, a decrease in

preweaned calf illness and deaths was observed when moving from poor to excellent TPI.

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Survey of Cooked vs. Raw Specialty Asian Produce

UC ANR and UC Davis are conducting a survey of consumers to identify which types of specialty Asian produce are almost always cooked before eating, so that Southeast Asian and other small-scale farmers can receive exemptions from federal food safety regulations for low-risk crops. We would appreciate your help in taking the survey and sharing it widely with consumers of these crops, so that we can provide data to the FDA on whether they are eaten cooked or raw.

[Click here to take the survey and enter to win a \\$50 gift card](#)

Food safety regulations have exemptions for produce that is usually cooked instead of eaten raw, because the risk to consumers from human pathogens is much lower. Crops like potatoes, pumpkins, or lima beans that are almost always cooked before eating have a much lower risk than leafy greens such as lettuce and spinach that are frequently eaten raw. The FDA's current list of "[rarely consumed raw](#)" produce does not include many types of produce that are culturally important to diverse communities of consumers across the US, because the FDA does not have data on how they are eaten. Because these crops

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Survey of Cooked vs. Raw Specialty Asian Produce cont.



Complete the listed survey for a chance to win \$50

are not on the list, small-scale farmers growing specialty produce cannot receive the exemptions that mainstream crops do, even if their crops are never eaten raw. We now have an opportunity to submit data to the FDA on additional crops that usually are cooked, pickled, or fermented to kill any disease organisms before eating. Data will be shared with the FDA to recommend additional culturally important crops to be added to the “rarely consumed raw” list, so that these crops can receive the same exemptions as mainstream “rarely consumed raw” crops under the federal Food Safety Modernization Act (FSMA).

Please help us contribute to making federal food safety regulations more inclusive of diverse communities of farmers and consumers. [Click here](#) or on the link above to take

the 15-minute survey, and please share widely with any individuals or organizations who might be interested.

As a thank you for completing the survey, respondents can enter a drawing to receive one of ten \$50 gift cards.

Thank you for helping to support small-scale and diversified farmers!

Alda Pires

For any questions regarding this survey please contact:

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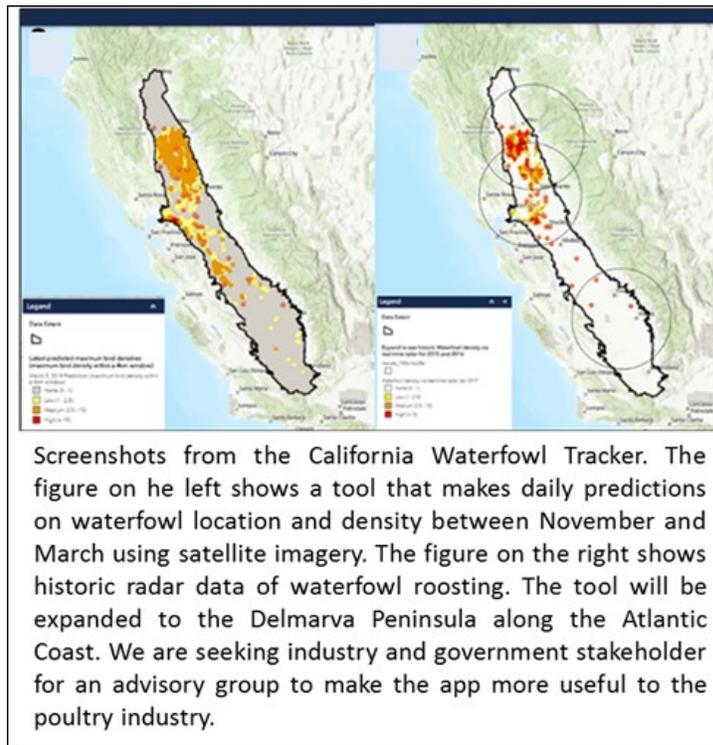
Seeking Stakeholders for Avian Influenza Waterfowl Tracker Advisory Group

Recently UC Davis Vet Med Extension, USGS and the University of Delaware received a 4-year USDA grant titled “*Real-time Waterfowl Mapping Web Application: Validating a Critical Tool for a New Era of Avian Influenza Surveillance to Improve Food Security in Commercial Poultry*”.

This project builds off of a 3-year UC-ANR project to further develop remote sensing technologies including weather radar, satellite imagery and telemetry of waterfowl to map waterfowl habitat in close proximity to commercial poultry in the Central Valley of California and the Delmarva Peninsula in Delaware (both large poultry growing areas). In addition the project leverages our previous UC-ANR research on detection of avian influenza virus (AIV) in wetlands using ultrafiltration and a novel PCR approach refined in Sam Diaz's lab at UCD that is more able to detect the wide range of AI viruses in the environment vs standard approaches.

You can visit the California Waterfowl Tracker and read the article on detecting avian influen-

za in California wetlands targeted via remote sensing [here](#).



Our goal is to develop a "real-time" mapping tool that allows stakeholders the ability to better understand their proximity to waterfowl and AIV in the environment. If successful, we hope to expand the system across the U.S.

What we need: We need stakeholders (industry and government) who can meet 1-2x a year to provide feedback on the functionality of the web-tools we are developing. Our goal is to make the tools practical and easy to use as currently, they are not. We will

be offering an annual \$300 honorarium for up to 3 hours of work (a maximum of two 1.5 hr meetings per year).

If interested please contact Brian Ladman (bladman@udel.edu) and/or Maurice Pitesky (mepitesky@ucdavis.edu).

Brian Ladman and Maurice Pitesky

Post-Fire Egg Safety Webinar: Food Safety and Urban Fires

The past three years have brought unprecedented wildfire activity in the state of California. What makes these wildfires unique isn't simply their massive scale, but that many involve urban areas as opposed to the traditional rural or woodland wildfire. In the Pitesky Lab, we have received numerous questions as to safety of backyard poultry products in the face of these urban wildfires – essentially, are eggs from backyard poultry that have been exposed to ash and smoke from urban wildfire safe to eat? To help answer that and related questions, the results of research from our lab and collaborating groups within UC Agriculture and Natural Resources regarding the safety of backyard food production (poultry and produce) was presented in a two hour webinar last month, which can be found on [YouTube](#).

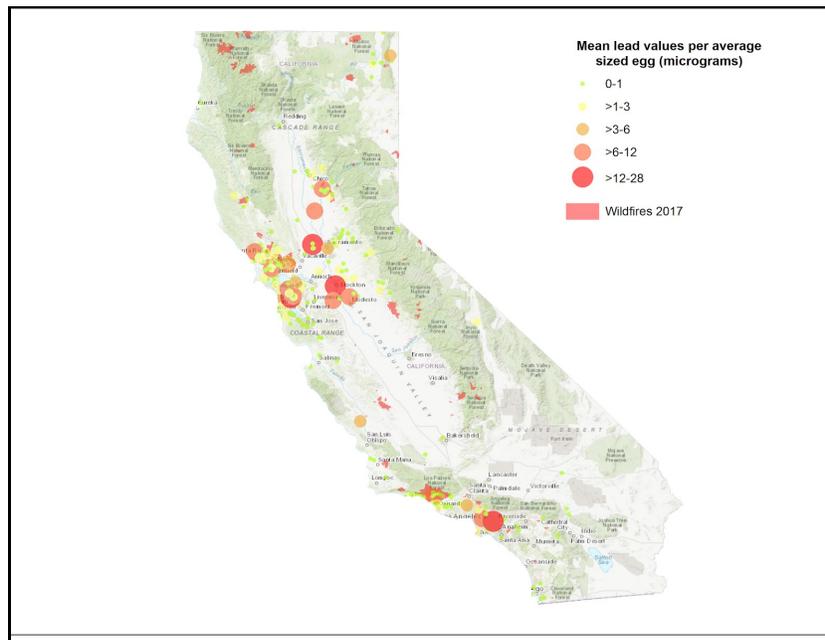
Suzy Grady from Petaluma Bounty, set the context for the webinar by detailing the massive destruction that wildfire has brought to the North Bay since 2015. But she is careful to note that each wildfire event is unique, and “...with each fire, there are different consider-

ations. We are sharing this information in hopes that you can build off of our experience and lessons learned” – a theme that would be repeated multiple times during the webinar.

Clare O'Brien, a PhD Student in the Pharmacology and Toxicology Graduate Group, discussed the nature of the chemicals to be concerned about in smoke and ash, such as

heavy metals, industrial chemicals like PCBs and fire retardants (PBDEs – it was noted later in the webinar that these are not the same as the red powder dropped from airplanes for fire suppression activities, which are largely harmless). These compounds can cause a variety health issues including cancer

and endocrine system disruption (the endocrine system comprises the hormone signaling systems in your body and includes organs like the thyroid, the adrenal glands, and ovaries). O'Brien was careful to note that assessing risk from these substances is not straightforward, as there are considerations



Representation of lead concentrations in average sized eggs across California, based on a 2018 study through the Pitesky lab.

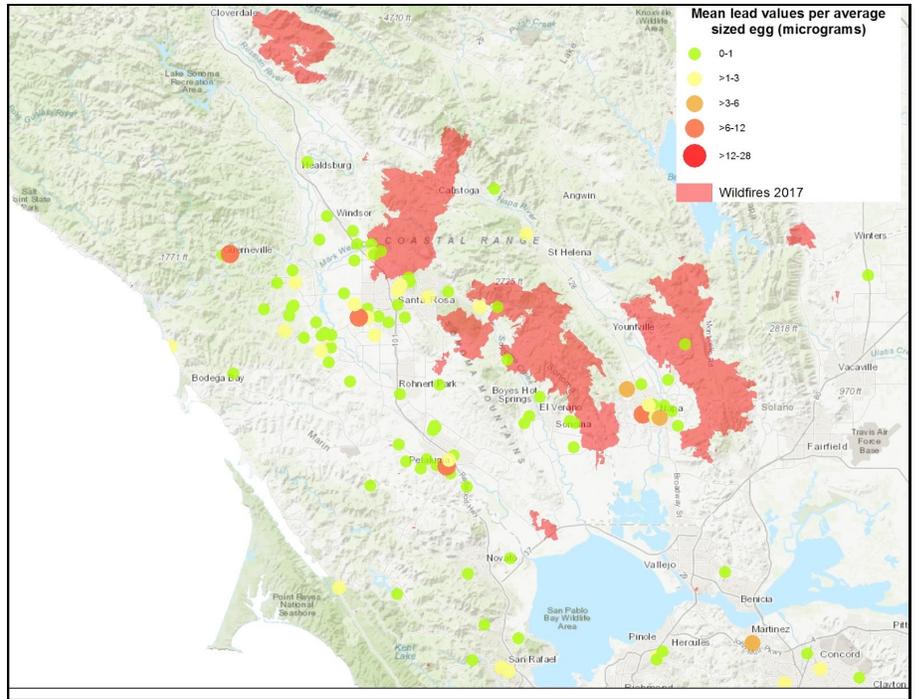
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Post-Fire Egg Safety Webinar: Food Safety and Urban Fires cont.

far beyond the toxicity of a given chemical (what dose is required for a given substance to be toxic) – it requires assessment of how long a chemical persists in the body, how long a period of time a given individual is exposed, and what vulnerability factors are at play (e.g. being very young or very old, dealing with other major health issues like diabetes, or having limited access to health care).

Julia Van Soelen Kim, a North Bay Food Systems Advisor with UC Cooperative Extension, detailed the results of a study that her and her colleagues undertook to assess the safety of leafy greens after urban wildfire. Fortunately, the outcomes thus far have been positive: “There was very low concern about chemicals on produce.” She notes that even under a very conservative estimate of toxic exposure after urban wildfire, the benefit of eating leafy greens far outweighs the risk. While this is indeed good news, she cautioned against generalizing the results of the study, reiterating that each fire event is unique and that the limited size of their study leaves room for further investigation. Good food safety practices, such as washing hands before and after harvesting and washing produce before consuming are absolutely warranted.

Rob Bennaton, a Bay Area Urban Agriculture Advisor from UC Cooperative Extension in Alameda, discussed the impacts of urban wildfire on soil health and the implications for backyard agriculture. The take-home message was that much is yet to be discovered



Close up of lead concentrations in eggs, overlaid with 2017 urban fires in California.

about both the short and long term implications of wildfire on soil health. He stated that [the UC Master Gardener Program](#) can provide support and direction for those residing within the state as to how to properly assess your own soil health after wildfire. Bennaton also noted that both local government agencies and private contractors can assist with post-fire clean-up and testing. Even after cleanup, it is important to consider all exposure pathways when working in and around soil and make use of best practices, including wearing gloves and boots, provide mulch & drip irrigation (to avoid up-splash), and consider importing clean soil and building raised beds.

Finally, Todd Kelman, a veterinarian from the Pitkesy Lab in the Veterinary School at UC Davis, discussed the safety of eggs from

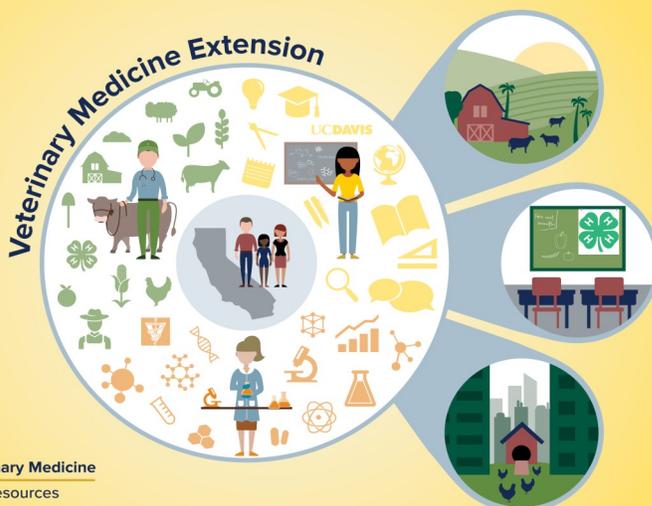
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Post-Fire Egg Safety Webinar: Food Safety and Urban Fires cont.

backyard poultry after wildfire events. He discussed that previous studies had identified heavy metals (such as lead) in eggs of backyard poultry (not as a function of wildfire but from other exposures), and that ash from urban wildfire had been shown to contain high levels of heavy metals. “Given what chickens do all day – peck at the ground for hours on end, that makes for a pretty good hypothesis – that urban wildfire could pose a risk for the production of eggs and poultry that contain heavy metals and other substances.” A study was performed by the Pitesky lab to assess exactly that hypothesis, the results of which have been detailed in previous versions of this newsletter. In short, heavy metals and organic pollutants (like the PCBs and PBDEs mentioned earlier) were measured in eggs of backyard poultry from 344 sites around California. The primary intoxicant discovered was lead – in 8% of premises (27 total), the average egg lead concentration exceeded the FDA recommendation for daily intake by a child (3 micrograms). While the study did not reveal any relationship between proximity to wildfire and egg lead concentration, Kelman noted that diligence is still absolutely warranted: “So, is it safe to eat eggs

from your backyard poultry? Because of individual variability in risk, we can't give you a definitive answer to that question. But we do highly recommend that you assess your risk and reduce the risk of contamination.” He noted that you can assess your risk by sending eggs into [the California Animal Health and Food Safety Laboratory System](#) for heavy metal testing, which at this time runs about \$60. Best practices for risk reduction include using a chicken feeder that prevents spillage onto the ground, confining chickens to known (tested) areas of the yard, and keeping them on raised beds. He noted that knowing what's in your water supply and in your plumbing (pipes and fixtures before 1986 can contain elevated levels of lead) is also extremely important. Additional resources were shared at the end of the talk. The slides with the full list of resources can be found [here](#), and once again [the entire talk is available on YouTube](#). Poultry specific information can always be found on [the UC Cooperative Extension Poultry website](#), on [our UC Davis Vet Med Poultry University YouTube page](#), and through [our new Android app!](#)

Todd Kelman



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