

# Reducing Risk

Best practices for reducing your probability of exposure

## Wash Your Produce

Thoroughly wash produce before storing, cooking and eating. Remove older, outer leaves of lettuce or leafy greens before eating. Peel root vegetables before eating.

## Test Your Soil

Collect soil samples from your garden and send them to a local lab to get analyzed. Some contaminants may have been present from before the fire.

## Contain & Amend Your Soil

Sheet mulching and building raised beds can keep kids from ingesting soil, prevent soil from getting kicked up in dust, and create a barrier between soil and produce. Adding compost can dilute contaminants and break down some pollutants. Phosphorous can bind lead.

# The Big Picture

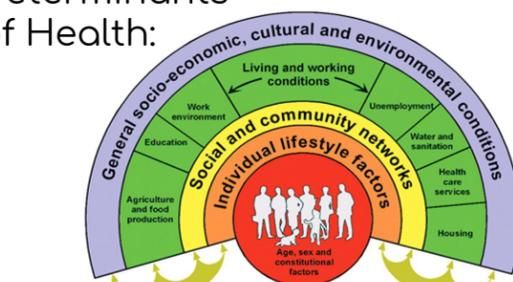
Putting Air Pollution and Local Produce in Context

## Uncertainty & Perspective

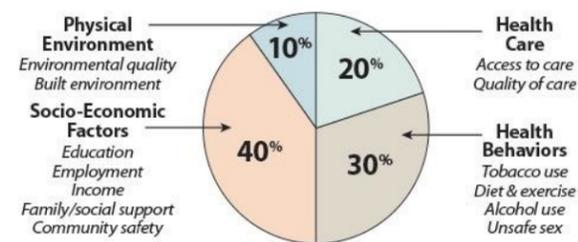
Food safety of produce following an urban wildfire event is under-investigated, and much is unknown. But we do know this is only a small slice of the big picture of what determines our health. All of the work we are doing to build a local food system, a strong economy, and community resilience can improve our region's health. Strong local food systems can enhance protective factors like good nutrition and social support.

At the end of the day, you are the expert of your body and your garden. We hope that with the information in this guide, you can think about your personal exposure and risk factors so that you can make the best decisions for you, from produce and beyond.

## Determinants of Health:



Social Determinants of Health, Dahlgren and Whitehead, 1991



Population Health Institute, County Health Rankings model, 2010

# Produce Safety After Urban Wildfire

Citizen Science Initiative -- UC Cooperative Extension Sonoma



# Understanding Risk

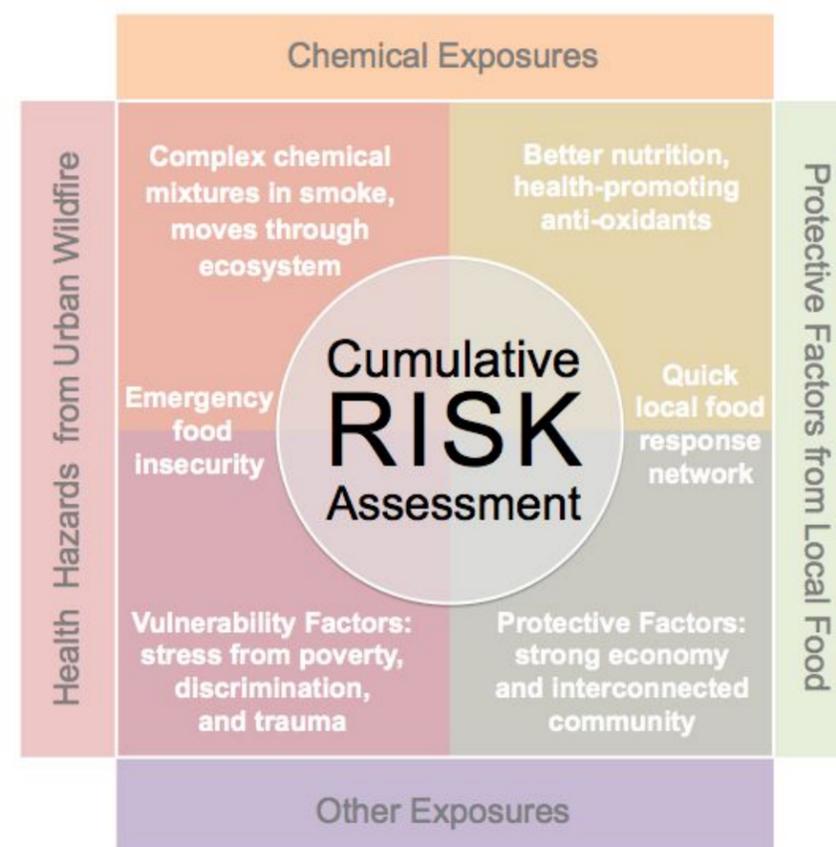
A community guide for assessing the potential health impacts of locally-grown produce exposed to urban wildfire smoke

Guide by Vanessa Raditz, Suzi Grady, Mimi Enright, Julia Van Soelen Kim

Support for this project provided by the Air District, UC ANR, Petaluma Bounty, and Sonoma County Residents.

The October 2017 Northern California fires created poor air quality and distributed toxic air contaminants over the region. Concerned community members started the *Produce Safety after Urban Wildfire Citizen Science Initiative* with the support of UC Cooperative Extension Sonoma County to assess the impact of this toxic smoke on local produce, taking over 200 samples of leafy greens from 25 sites across Sonoma County while fires were ongoing.

Local farms and gardens played a significant role in food relief efforts immediately following the fires, providing produce to food pantries, evacuation shelters, and kitchens. Farmers, as well as school, community and home gardeners expressed concern about the potential health impact on themselves, children, food insecure communities, and other vulnerable populations. This guide is intended to help concerned communities interpret study results and make informed decisions.



## Cumulative Risk Assessments

Our study uses this approach to examine the total set of exposures that could impact health, including and beyond chemical exposures. Wildfires hitting an urban area create innumerable **health hazards** for communities and the smoke from the fire can impact an even larger geographic area. When evaluating smoke on local produce, a **cumulative risk assessment** provides a more balanced evaluation of **protective factors** from local food, such as the health benefits of open green spaces and nutritious produce, and the socio-economic impacts of a strong local economy and interconnected community.

## Connect With Us & Find Out More

Email updates and forum discussions  
[groups.google.com/forum/#!forum/produce-safety-after-urban-wildfire](https://groups.google.com/forum/#!forum/produce-safety-after-urban-wildfire)

UC CE Reports and resources for community and researchers:  
[www.cesonoma.ucanr.edu/Produce\\_Safety\\_after\\_Urban\\_Wildfire/](http://www.cesonoma.ucanr.edu/Produce_Safety_after_Urban_Wildfire/)

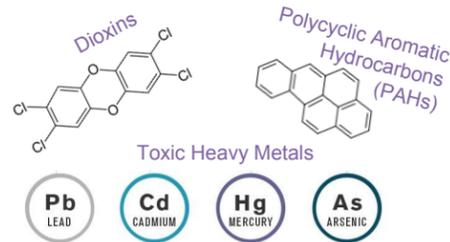
Upcoming events and updates that can be easily shared  
[www.facebook.com/ProduceSafetyAfterUrbanWildfire/](https://www.facebook.com/ProduceSafetyAfterUrbanWildfire/)

# Air Pollution → Local Produce → Health Outcomes

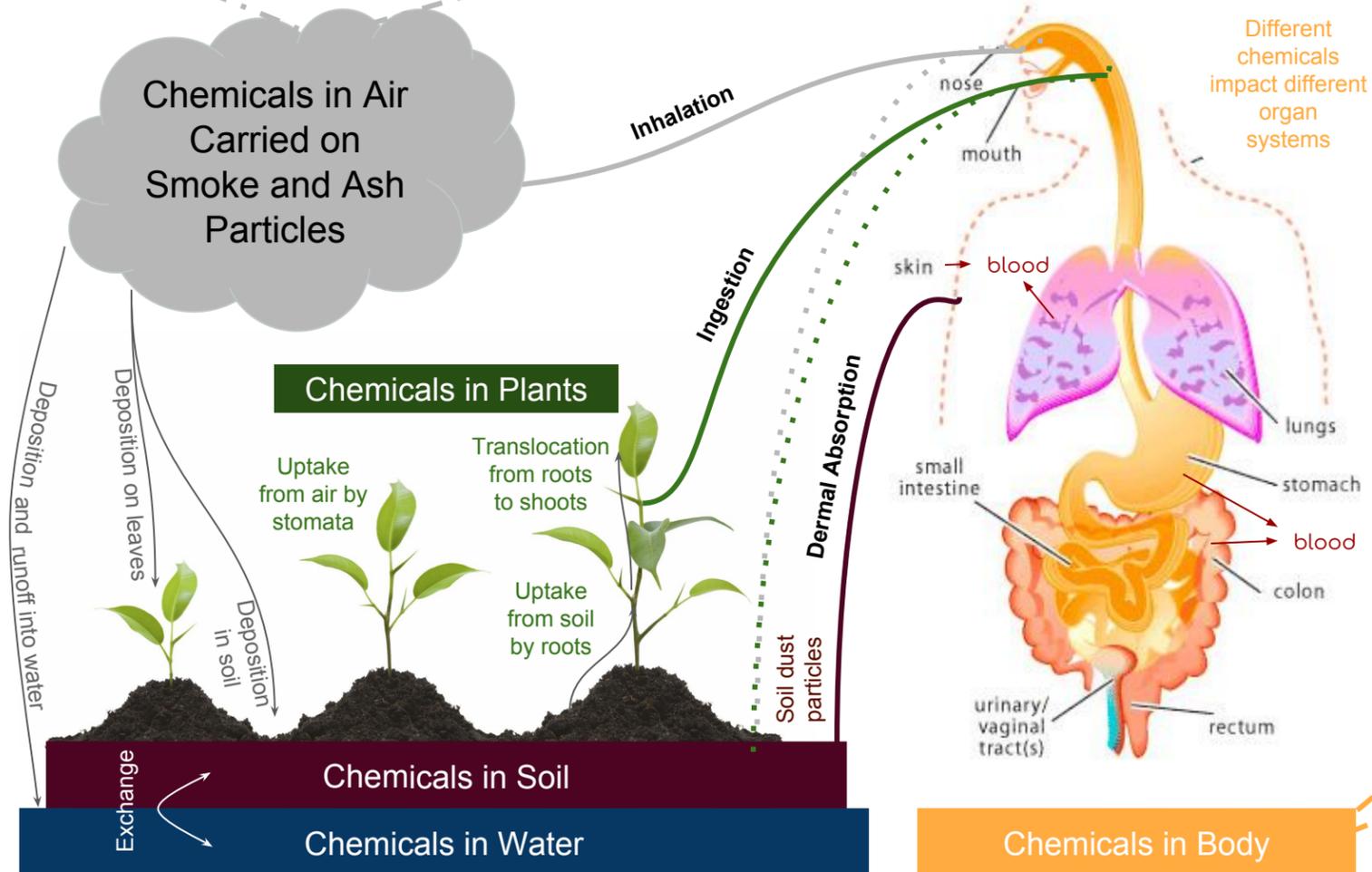
Can chemicals in urban wildfire smoke contaminate local produce?

## Different chemicals have very different properties

There are thousands of different chemicals in our homes, consumer goods, and industries that can get into smoke during an urban wildfire. Each of these types of chemicals move through the environment differently depending on their physical properties. For example, fat-soluble chemicals are more likely to persist in the food system, while water-soluble chemicals are more likely to wash off.



Chemicals in smoke move through the ecosystem



If chemicals from smoke are found in produce, is it still safe to eat?

## Not all chemical exposures lead to disease

Many of the chemicals that are carried in smoke can cause or exacerbate diseases like cancer, immune deficiency, neurological impairments, and more. For most of these chemicals, Proposition 65 has defined a “**No Significant Risk Level**”, a daily intake threshold that would cause fewer than 1 in 100,000 people in the exposed population to get sick. This threshold takes into account toxicological data about how potent a chemical is, how long it persists in the body, and the way it causes disease.

## LIKELIHOOD OF HEALTH OUTCOMES

Toxicity of Chemical:

Toxic even at very low doses

Toxic only at very high doses

Chemical Persistence:

Persists in the body

Excreted quickly

Duration of Exposure:

Chronic: More than 3 months

Acute: Less than 24 hours

Personal Context:

More Vulnerability Factors

More Protective Factors



### “Likelihood” & “Risk”

These terms are all about **probability**. A statistical assessment of the chances for a given outcome across **the entire population**. Risk is generally not based on you as an individual.

## You can be exposed in many different ways

Chemicals can get into your body through **inhalation**, **ingestion**, and **absorption** through skin. Inhalation is the most direct way you can be exposed to air pollution, and often the most dangerous, because lungs can pass chemicals easily into bloodstream, moving them throughout your body. The smoke from the fire is only part of the story; there are already chemicals in all air, soil, water, plants, and bodies *present from before the wildfire*. At any point along this pathway, chemicals in the environment and in your body can *interact with each other* or *break down* into new chemicals (called “metabolites”).

## Vulnerability and Protective Factors

The likelihood that an *individual* within the population experiences health impacts depends on a lot of factors, including both vulnerability and protective factors. For instance, **fetuses** and **children** are particularly vulnerable to exposure because they are still developing, and because a smaller exposure leads to a higher dose-per-body-weight. People with **pre-existing conditions** and with high-levels of **chronic stress** (such as from poverty and experiences of discrimination) are also more vulnerable.