



BERKELEY LAB
LAWRENCE BERKELEY NATIONAL LABORATORY



Citizen Science and Residential IEQ Research at LBNL

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LBNL Community Advisory Group

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Why does LBNL study Indoor Environmental Quality?

1. Buildings use a lot of energy. They need to use less.

1. Building energy and IEQ closely linked

- Air sealing to reduce infiltration impacts pollutant levels
- Thermal conditioning and humidity control for comfort
- Ventilation and filtration
- Lighting

3. Good IEQ independently valuable



Indoor environments are important to our health, welfare and productivity

Ron Brenner



- Americans spend 90% of our time indoors
- Most of the air we breathe is in buildings
- Most of our productivity occurs in buildings

Matthew Paulson



Dan4th Nicholas

Sept-2014

Being indoors can help protect us from outdoor air pollution



Many pollutant sources inside homes

Magnus Forrester-Barker



Drew Mackie



Jessica Spengler



Wellcome Images



Danny Howard

Cooking as a pollutant source



Carbon dioxide
Water vapor
Carbon monoxide
Nitrogen dioxide
Nitrous acid
Formaldehyde
Ultrafine particles



Formaldehyde
Ultrafine particles
Acetaldehyde
Acrolein
PM_{2.5}
PAH
Etc.



Ultrafine particles



Gas cooking without venting can produce high pollutant levels in homes

12,000,000

Estimated number of Californians that are exposed to air pollutants from gas burners in their homes at levels that exceed EPA standards for outdoor air

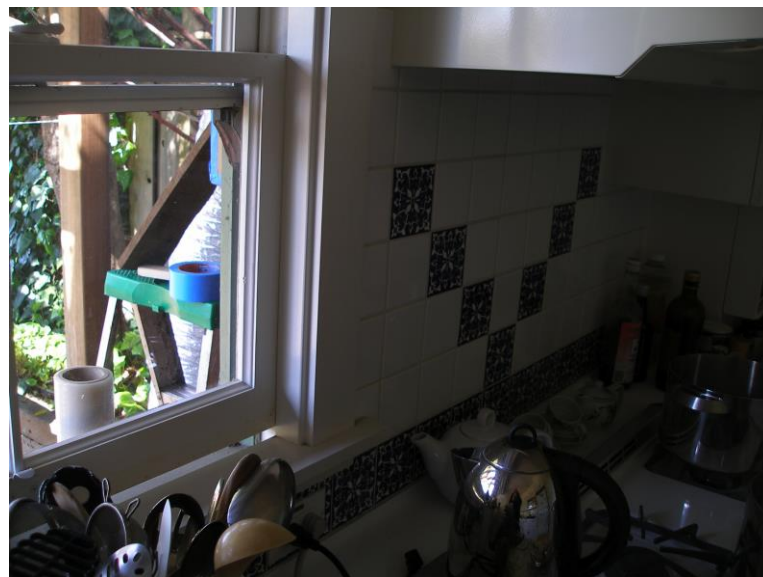
All EHP content is accessible to individuals with disabilities. A fully accessible (Section 508-compliant) HTML version of this article is available at <http://dx.doi.org/10.1289/ehp.1306673>.

Research

Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California



Kitchen ventilation reduces exposures



How do you know if it is effective?



The effectiveness of range hoods at capturing cooking pollutants is called **capture efficiency**.

LBLN Kitchen and Range Hood Lab



Thanks to Kitchen Ventilation Research Team



Woody Delp



Jennifer Logue



Melissa Lunden



Tosh Hotchi



Marion Russell



Max Sherman



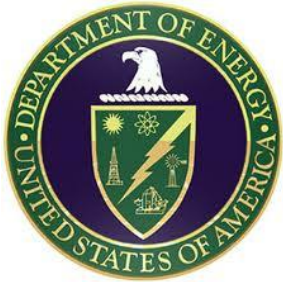
Chris Stratton



Iain Walker

*Thanks also to:
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Victoria Klug,
Jina Li,
Nasim Mullen,
Angela Simone*

Sponsors of Kitchen Ventilation Work



U.S. Department of Energy



Office of Healthy Homes and Lead Hazard Control



Indoor Environments Division



Goal: Kitchen Ventilation for ALL

How do we get there?

Awareness

Building codes

Product standards

Questions

How many homes have any kitchen ventilation?

What kinds do they have?

It is effective?

Does it get used?

If not, why not?

Citizen Science

**The Research Team
is
YOU**

Inside Information: INDOOR AIR QUALITY

BERKELEY LAB EXPERTS TALK INDOOR AIR



Looking for Hazardous Pollutants in Your Kitchen



For decades, teams of Berkeley Lab scientists have investigated the ways that indoor air quality affects human health—from cognitive ability to personal comfort. Lab scientists were among the first to sound the alarm about sick buildings, including the health risks posed by radon, and also to offer solutions to make buildings healthier. They continue to identify and monitor other sources of indoor pollution—from cooking byproducts to thirdhand smoke, and to substantiate the health virtues and cost savings of energy-efficient ventilation, particularly in schools. Berkeley Lab experts have changed—and continue to change—the national thinking about what constitutes healthy building design and use.



Recent News

Sept 2013

[Berkeley Lab Indoor Air Roundup: Natural Ventilation Comes with Health Risks, and more](#)

Aug 2013

[Secondhand Smoke in Bars and Restaurants Means Higher Risk of Asthma and Cancer](#)

July 2013

[Kitchens Can Produce Hazardous Levels of Indoor Pollutants](#)

Jun 2013

[Berkeley Lab Confirms Thirdhand Smoke Causes DNA Damage](#)

Jun 2013

[More Fresh Air in Classrooms Means Fewer Absences](#)

Apr 2013

[Hidden Dangers in the Air We Breathe](#)

HOME AIR QUALITY

Select a story below to learn about the groundbreaking research by Berkeley Lab scientists as to how thirdhand tobacco smoke can produce dangerous carcinogens.

WORKPLACE AIR QUALITY

For information about Berkeley Lab's research on indoor air in the workplace and the effects of unhealthy air on cognitive function, see the stories below.

MOLD

Berkeley Lab has a long history of leading edge research on the public health risks and economic consequences of building dampness and mold.

Inside Information: RANGE HOOD ROUNDUP


Berkeley Lab scientists have spent decades investigating how everyday activities affect indoor air quality. We study pollutant sources in homes and develop effective controls. Our recent study found that cooking without proper kitchen ventilation often produces air pollutant levels in homes that exceed outdoor air quality standards.

We need your help to learn more. Berkeley Lab's Range Hood Roundup is gathering information about cooking patterns and kitchen ventilation in U.S. homes. Please join our science team by completing a short survey. We will use the information you provide – along with data from thousands of others across the country – to develop recommendations for improving indoor air quality and health through better building codes and product standards.

The survey has 10-12 questions depending on the equipment in your home. It should take just a few minutes.

Thank You!

INDOOR AIR AND YOUR HEALTH



Berkeley Lab Citizen Science Survey

**BECOME A CITIZEN SCIENTIST:
TAKE THE SURVEY**



**BERKELEY LAB'S
INDOOR AIR RESEARCH**



CONTACT US

TOP

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Introduction

Thank you for stepping up as a Citizen Scientist!

Your responses are anonymous and will be used for research purposes only. Please see the privacy statement below for more information.

The survey is divided into two sections:

1. Short survey about your home and kitchen ventilation (10-12 questions)
2. Additional questions
 - Kitchen Ventilation and Cooking
 - General Indoor Air Quality
 - Building and Household Demographics

After completing the short survey questions, please consider completing the additional questions to increase the scientific value of the survey data.

By clicking on the **"Continue"** button at the bottom of this page you indicate that:

- You have read the above information.
- You are at least 18 years of age.

If you do not wish to continue, you may close this page by clicking the **"Exit Survey"** button below.

For questions about the survey, please send an email to IAQSurvey@lbl.gov.

Thanks again!

Privacy statement: *The last section of the Range Hood Roundup asks general questions about your household, like the number of people living there and household income. We promise to not ask any questions or collect any information that could be used to identify you or your home. We are using Survey Gizmo to host the Range Hood Roundup survey. Survey Gizmo's Anonymous Survey feature ensures that your IP address and geo-location are not recorded and will remain private. For more information, please see Survey Gizmo's [privacy page](#) and their description of [Anonymous Surveys](#).*

Exit Survey

Continue