



Introductory Comments

**KITCHEN VENTILATION SOLUTIONS TO  
INDOOR AIR POLLUTION HAZARDS  
FROM COOKING**

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# Problems from Cooking & Gas Stoves

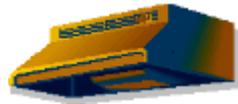
- Air pollutants
  - Gaseous pollutants (CO, NO<sub>2</sub>, formaldehyde, etc.)
  - Ultrafine particles and PM<sub>2.5</sub>
  - Metals
- Moisture, odor



**Air pollutant emissions can exceed health benchmarks!**

- Increased asthma symptoms
- Increased upper respiratory diseases in children

# Solutions for Removal of Air Contaminants from Kitchens



Range hoods



Open windows



Wall or ceiling exhaust fans

- **How effective are they?**
- **How to improve their performance?**
- **Test methods needed?**

# Today's Speaker



## **Brett C. Singer, Ph.D.**

Staff Scientist and Principal Investigator  
Environmental Energy Technologies Division  
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Today's seminar will cover:

- The hazards associated with gas stoves and cooking emissions
- Laboratory and in-home measurements of range hood performance
- Characteristics of effective range hoods, and challenges
- The potential effectiveness of general kitchen ventilation