Kitchen Pollutants

Question: What are indoor “pollutants”?

Ventilation receives more attention these days because houses are more airtight and better insulated than ever before. While this saves on heating costs, it also means that passive air leakage through the building envelope will not provide sufficient ventilation. Mechanical ventilation systems, such as exhaust fans or HRVs, are needed to flush out pollutants and provide fresh air to occupants.

Pollutants can be introduced into a home in many ways – people breathe out carbon dioxide, heating appliances can produce carbon monoxide, radon can leak in through the foundation, and dust can blow in through a door or window. Pollutants are also produced in kitchens, one reason for installing range hoods above stoves.

What pollutants are produced in kitchens?

Cooking is a source of both moisture and odors. Both of these are good in small doses – water vapor helps to maintain higher indoor humidity during dry winters and smells can entice the family to a common place. Excess humidity, however, is conducive to mold growth.

Gas burners release gases directly into a home, and they can reach harmful levels if not exhausted. Nitrogen dioxide, which can cause respiratory problems, is produced as a result of gas combustion. So is carbon monoxide, a colorless, odorless gas that reduces oxygen delivery to organs and can be very harmful—and even fatal—to humans. If you have a gas burner, it’s a good idea to have a carbon monoxide detector in your kitchen, in addition to ventilation.

All cooking appliances also produce small airborne particles, including particles under 2.5 micrometers in diameter that can enter lungs and cause respiratory problems. An extreme example of this (and one you can smell) is when you turn on a heating appliance that has been off for a long time, such as when you use a toaster that hasn’t been used in months. Finally, certain cooking methods and foods can result in other harmful pollutants. The most common is acrolein, which many people will recognize as the acrid smell of burnt fats, such as cooking oil.

What is effective kitchen ventilation?

First, effective kitchen ventilation will depend on the amount and type of cooking that you do. Boiling water for mac and cheese every once in a while will not produce as many pollutants as pan frying steaks during on a Saturday night in a restaurant. Of course, most homes fall between these two extremes. Consider your cooking habits when choosing a ventilation strategy.

Range hoods are your best option for kitchen ventilation and come as stand-alone systems or can be integrated into other kitchen appliances, such as microwaves. They should be turned on every time you cook. Range hoods can vary in performance, so it is important to ensure that your system provides sufficient ventilation for the type and volume cooking that you do. Also, range hoods must actually exhaust air outside a home rather than just circulate air through a grease trap. Ideally the range hood should also extend over all burners of the stove. In the summer, opening a window can also help with ventilation.
Whole house ventilation systems such as HRVs also help provide adequate ventilation for your house while cooking, as it’s common for range hoods to capture only a fraction of the pollutants released. One option is to use a boost mode for the HRV while cooking. If you do use an HRV for kitchen ventilation, be careful that the HRV is not in recirculation mode (which circulates air through a home but does not exhaust air outside and bring in fresh air) during cooking times.