

The Cleaning Mistake That Can Harm Your Pet's Lungs

Even when using 'green' cleaners, there's one important rule you must always follow. Failure to do so can result in the production of harmful volatile compounds that can travel deep into your pet's (and your own) lungs. Reduce your pet's toxic load with these household cleaning options.

Analysis by [Dr. Karen Shaw Becker](#)

STORY AT-A-GLANCE

- Many homeowners aren't aware that using bleach in addition to household cleaners containing limonene can pollute the indoor air, potentially harming the health of both two- and four-legged family members
- Used together, these chemicals create air particles called secondary organic aerosols (SOAs) that can compromise lung function, exacerbating conditions such as asthma and heart disease
- If you use chemical cleaning products in your home and are concerned about the health of family members, including pets, consider switching to nontoxic, inexpensive alternatives such as vinegar, lemon juice, and baking soda

Editor's Note: This article is a reprint. It was originally published June 19, 2022.

When it comes to not only spring cleaning, but weekly or even daily cleaning chores, many people use both chlorine bleach and one, two, or more household cleaners, including "green" cleaners containing limonene (a compound with a lemon, orange or pine scent). And while there's nothing that beats a freshly scrubbed home, the chemicals used in the process can create a harmful indoor environment for two- and four-legged family members alike.

In fact, according to a 2019 study published by the American Chemical Society (ACS), scientists have discovered that bleach fumes combined with light and products containing limonene can form airborne particles that might be harmful when inhaled by pets or people.¹

Bleach + Citrus Cleaners + Light = Indoor Air Pollution

Cleaning products containing bleach emit chlorine-containing compounds into the air that can accumulate at relatively high levels in inadequately ventilated indoor environments. These gases can react with other chemicals such as limonene, and both indoor lighting and sunlight through windows can enhance the reaction. The air pollutants that result have been linked to respiratory and other health problems.

For the 2019 study, the researchers wanted to know if limonene and bleach fumes, at concentrations likely to occur indoors, could react to produce air particles called secondary organic aerosols (SOAs) under light and dark conditions. From an ACS news release on the study:

"The researchers added limonene, HOCl and Cl₂ [chlorine-containing compounds hypochlorous acid (HOCl) and chlorine gas (Cl₂)], to air in an environmental chamber and then measured the reaction products using mass spectrometry. In the dark, limonene and HOCl/Cl₂ quickly reacted to produce a variety of volatile compounds.

*When the team turned on fluorescent lights or exposed the chamber to sunlight, these volatile compounds interacted with the light-generated hydroxyl radicals and chlorine atoms to form SOAs. Although the composition and possible health effects of these particles need to be studied further, they could be occupational hazards for people involved in cleaning activities, the researchers say."*²

According to the research team, this is the first time anyone has analyzed the effect of limonene in combination with hypochlorous acid and chlorine gas under dark conditions, and they were able to demonstrate that the reaction off-gassed volatile compounds. However, perhaps more importantly, when indoor lights were turned on, the two compounds formed SOAs at significant levels, and exposure to sunlight increased the levels and sped up the reactions.

Short- and Long-Term Health Effects of SOAs

SOAs are a major component in the tiny particles in the air that at high levels cause a smoggy haze and reduce visibility. As reported by CNN, "If small enough, these particles are able to travel deep into our lungs, causing short-term health effects such as eye, nose and throat irritation, coughing, sneezing and shortness of breath."³

The result is compromised lung function, which can severely affect people and pets with asthma and heart disease. When fine particle counts are high, there's a corresponding increase in emergency room visits, hospital admissions, and deaths. It's one of the reasons many cities issue health advisories when the air is expected to be at unhealthy levels.

Continued exposure to poor air quality is associated with chronic bronchitis and increased mortality from lung cancer and heart disease.

"In all cases," per CNN, "the researchers concluded the results could 'lead to negative health effects for indoor occupants,' especially anyone who spends a good deal of time cleaning, those who use industrial strength cleaning supplies, and children and the elderly."

I would also add family pets to this list, since they tend to spend a lot of time indoors and low to the ground, where particulate matter in the air ultimately settles.

Is Your Cleaning Routine Damaging Your Pet's Health?

If you're a cleanliness-minded pet parent, it's important to understand that most commercial cleaning products pollute the air inside your home, and the more cleaning you do, the greater the buildup of toxins in your environment.

Common symptoms of irritation from cleaning product fumes include eye irritation and breathing problems.

If your dog licks the floor occasionally, he's ingesting small amounts of whatever floor cleaner you use. Your pets also walk around on the floor, lie on it, and lick their fur and paws, which is another way they can ingest cleaning chemicals.

Does your dog drink out of the toilet? Toilet bowl cleaners are among the most toxic for pets, especially the kind that clip to the edge of the toilet or sit in the tank, because their purpose is to deliver a constant level of chemicals to the toilet water. These caustic agents can burn your dog's mouth and throat, at a minimum.

Traditional cleaning agents can contain toxins such as bleach, ammonia, chlorine, phenol, isopropyl alcohol, and formaldehyde, all of which are potentially harmful to your pet. Symptoms of ingestion include vomiting, diarrhea, lethargy, seizures, coma, and in severe cases, death. If your pet gets a caustic substance on his body, it can cause a rash or a burn on his skin.

Many of today's popular cleaners also contain antibacterial substances that are not only unnecessary but also encourage bacteria to mutate and become resistant to killing agents.

Recommendations for Nontoxic Household Cleaners

Replacing chemical household cleaners with a few simple, inexpensive, and nontoxic agents will lighten the toxic load of everyone in your home, including your pet.

1. **Kitchens and bathrooms** — For cleaning and disinfecting kitchen and bathroom surfaces, dust with baking soda, then wipe with a moist cloth or sponge. For tough grime, add some salt and scrub it away.

To tackle grease, mildew, or other stains, spray the area with lemon juice. Let it sit for a few minutes, and then scrub with a stiff cleaning brush.

If you need to disinfect a surface, an effective homemade solution is a mixture of 2 cups water, 3 tablespoons of liquid castile soap, and about 25 drops of tea tree oil, which is naturally antibacterial and antifungal.

2. **Bare floors** — If you have wood, ceramic, linoleum, or vinyl flooring, you can use a vinegar and water solution instead of a chemical floor cleaner. Since pets are so low to the ground, this is an especially important tip. I recommend adding one cup of vinegar to one gallon of warm water to mop the floor.

There's no need to saturate the floor while mopping. Go easy and let the vinegar and water mixture do all the work. And there's really no need to rinse, but if you find the floor has a dull appearance after it dries, you can mop again with straight club soda to add a nice shine.

To remove stains on your vinyl floor, dip a clean cloth in full-strength lemon juice and rub it into the stain.

3. **Polishing wood furniture** — Most store-bought furniture polish contains petroleum products that are toxic. Furniture polish sprays pollute the air with potentially hazardous chemicals that everyone in your home breathes into their lungs, including four-legged family members.

Instead, try a mixture of olive oil and lemon juice. Use 2 parts olive oil to 1-part lemon juice. Apply it to your furniture with a soft cloth, and then do a final polish with a second clean cloth.

You can also use coconut oil on wood furniture, but this doesn't work so well if your pets love the stuff and follow you around like mine do, licking it off as fast as I put it on!

4. **Windows and mirrors** — You don't need ammonia-based products to clean windows and mirrors around your home. Instead, use a mixture of 4 tablespoons lemon juice and half a gallon of water.

Also consider using clean lint-free cloth rather than paper products to wipe surfaces clean. Old cotton t-shirts or cloth diapers can also work well for windows and other glass surfaces.

5. **Unclogging a drain** — If you have a sink or tub clogged with pet hair or other gunk, it's a good idea to avoid caustic chemicals and drain cleaners as much as possible. I recommend pouring half a cup of baking soda in the drain, followed by 2 cups of boiling water.

If you have a tough clog, you can follow the baking soda with a half-cup of vinegar. Close or cover the drain tightly while the soda-vinegar mixture is bubbling up and breaking up the clog. Once the fizzing stops, flush the drain with a gallon of boiling water.

This is far from a complete list of all the ways you can reduce or eliminate the use of chemical cleaners in your home, but it's a great start.

Sources and References

¹ [Indoor Illumination of Terpenes and Bleach Emissions Leads to Particle Formation and Growth](#)

² [ACS News Service Weekly PressPac: October 02, 2019](#)

³ [CNN, October 2, 2019](#)
