

20 'Forever Chemicals' Found in Pets and Horses

Dogs, cats & horses are being exposed to potentially hazardous levels of long-lasting chemicals like PFAS, & traces are showing up in their blood. Used in pet food packaging (here are four of the worst brands) & found in everyday objects around your home, here's how to reduce your pet's exposure.

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STORY AT-A-GLANCE

- A recent study reported elevated levels of PFAS (per- and polyfluoroalkyl substances) in the blood of both dogs and horses in a community in North Carolina
- Interestingly, PFAS was found not only in the blood of dogs who drank tap water and water from other sources, but also in dogs who drank only bottled water
- The study results established that horses are an important sentinel species; the study is also a step toward investigating connections between PFAS exposure and liver and kidney function in dogs and horses
- In 2022, the Environmental Working Group (EWG) released a report that proves the presence — at high levels in some cases — of PFAS in pet food bags; these chemicals are ubiquitous in the environment, and when humans and animals absorb PFAS, the chemicals remain in their bodies for many years, if not life
- In 2020, researchers discovered the presence of PFAS at levels of exposure above the minimum risk level in the feces of dogs and cats living in New York State
- There are several steps you can take to limit your family's exposure to PFAS; also consider taking action to reduce your animal companion's chemical load

Recently, researchers from North Carolina State University (NC State) discovered elevated levels of PFAS (per- and polyfluoroalkyl substances) in the blood of both dogs and horses in Gray's Creek, NC.¹

As many of you who read here regularly know, PFAS are potentially toxic chemicals used in the manufacture of thousands of products, from ammunition, artificial turf, climbing ropes, and guitar strings, to pet food bags (to help "resist moisture, fats and oils, and otherwise keep products fresh").²

PFAS belong to a family of more than 3,000 structures of highly fluorinated chemicals used in industrial processes and consumer products.³ As a result, these chemicals are ubiquitous in our environment, having migrated into the air, household dust, food, soil and ground, surface and drinking water. According to one pet food industry journal:

"Along with their ubiquity, the problem arises from how slowly PFAS break down in the environment and in animals' bodies. People and animals absorb PFAS, and the chemicals remain in their bodies for many years, if not life."⁴

Important takeaways from the NC State study, published in June in the journal Environmental Science and Technology:⁵

- PFAS was found not only in the blood of dogs who drank tap water and water from other sources, but also in dogs who drank only bottled water
- Horses are now established as an important sentinel species (animals that can be used to detect risks to humans by providing advance warning of a danger)
- The study results are a step toward investigating connections between PFAS exposure and liver and kidney function in dogs and horses

20 Different 'Forever Chemicals' Found in NC Dogs and Horses

The study was conducted at the request of Gray's Creek residents concerned about the well-being of their animals. It included 31 local dogs and 32 local horses. All of the owner households were on well water, and all of the wells had been tested by state inspectors and found to be contaminated with PFAS.

All the dogs and horses underwent a veterinary exam, and their blood serum was screened for 33 different PFAS chemicals present in the Cape Fear River basin.

From the list of 33 PFAS, researchers found 20 different PFAS in the animals. All 63 had at least one chemical detected in their blood serum, and over 50% of the dogs and horses had at least 12 of the 20. Among the findings:

- PFOS, a long-chain PFAS with a history of use in industrial and commercial products, had the highest concentrations in dogs
- The perfluorosulfonic acid PFHxS, used in consumer products and firefighting foams, was detected in dogs, but not horses
- Some ether-containing PFAS, including HFPO-DA, were found only in dogs and horses who drank well water
- In dogs who drank well water, median concentrations of two PFAS, PFOS and PFHxS, were similar to those of children in a previous exposure study, suggesting that family dogs may serve as an important indicator of household PFAS
- Dogs who drank only bottled water had different types of PFAS in their blood serum; however, 16 of the 20 PFAS detected in this study were found in the dogs who drank bottled water
- Overall, horses had lower concentrations of PFAS than dogs, though they had higher concentrations of NBP2, a byproduct of fluorochemical manufacturing; this suggests that contamination of the outdoor environment, possibly from the presence of PFAS on forage, contributed to their exposure

PFAS Exposure Effects Liver and Kidney Function

According to lead study author Kylie Rock, postdoctoral researcher at NC State:

*"Horses have not previously been used to monitor PFAS exposure. But they may provide critical information about routes of exposure from the outdoor environment when they reside in close proximity to known contamination sources."*⁶

The animals' blood chemistry panels showed changes in diagnostic biomarkers used to measure liver and kidney function. The liver and kidneys in humans are primary targets of PFAS toxicity.

"While the exposures that we found were generally low, we did see differences in concentration and composition for animals that live indoors versus outside," study co-author Scott Belcher, associate professor of biology at NC State, told NC State News.⁷

"The fact that some of the concentrations in dogs are similar to those in children reinforces the fact that dogs are important in-home sentinels for these contaminants. And the fact that PFAS is still present in animals that don't drink well water points to other sources of contamination within homes, such as household dust or food."

Another Source of PFAS: Pet Food Packaging

According to a 2022 report by the Environmental Working Group (EWG), testing uncovered PFAS (specifically the chemicals PFBA, PFPeA, PFHxA, PFHpA, x62FTCA, x62diPAP and PFPrA) on 11 pet food packages from 7 pet food brands sold at Walmart and other retailers.⁸

While the **ultraprocessed pet food industry** is quick to point out that "the PFAS had not been identified in the pet foods themselves,"⁹ as the EWG report explains:

"Although our research found the suggestion of PFAS in pet food bags, we haven't concluded that the chemicals had migrated from the packaging to the food itself.

"But other research has established the potential for PFAS in packaging to contaminate the food within, which would put families and their four-legged friends at further risk."¹⁰

EWG contracted with an independent, certified laboratory to perform testing for total fluorine (in parts per million/ppm), the presence of which indicates the likely presence of PFAS (but not the specific types) (in parts per billion/ppb). Further testing for detectable levels of PFAS was performed on the four products with the highest concentrations of fluorine, with the following results:

Cat Food	Total Fluorine	Total PFAS
Meow Mix Tender Centers Salmon & Chicken Flavors Dry Cat Food	630 ppm	5.5 ppb
Purina Cat Chow Complete Chicken	310 ppm	244.7 ppb

Dog Food	Total Fluorine	Total PFAS
Kibbles n' Bits Bacon and Steak	590 ppm	14.3 ppb
Blue Buffalo's Life Protection Formula Chicken and Brown Rice Recipe	140 ppm	1.7 ppb

Pet Poop Samples Reveal Significant Exposure to PFAS

While the EWG did not conclude that the PFAS chemicals found in pet food packaging had migrated to the food itself, there's no question that dogs and cats are being exposed to these toxins in a multitude of ways.

For example, in 2020, researchers discovered the presence of PFAS "at levels that suggest exposures above the minimum risk level" in the feces of dogs and cats living in New York State.¹¹ Further, this level of exposure in animal companions may also have implications for pet parents.

For the study, which was published in the journal *Environmental Science & Technology Letters*,¹² researchers measured 15 different PFAS in 78 samples of cat and dog poop using high-performance liquid chromatography and tandem mass spectrometry. They detected 13 different PFAS in the samples, the most abundant of which in both cats and dogs were longer chain perfluorocarboxylic acids.

In estimating the pets' PFAS exposure levels, the researchers found that for three compounds (perfluorooctanoic acid, PFOA; perfluorononanoic acid, PFNA; and perfluorooctanesulfonic acid, PFOS) and for total PFAS, estimated exposure levels were above the minimal risk levels set by the U.S. Agency for Toxic Substances and Disease Registry. Because pets share homes with humans, it's logical to assume owner exposure as well

How to Reduce Your Family's Exposure to PFAS

Your best bet is to avoid all products that contain or were manufactured using PFAS, previously referred to as perfluorochemicals (PFCs), which will typically include products that are stain-resistant, waterproof, or non-stick. From the Environmental Working Group:¹³

- Find products that haven't been pre-treated and skip optional stain-repellent treatment on new carpets and furniture
- Cut back on fast food and greasy carryout food, since these foods often come in PFC/PFAS-treated wrappers
- Especially when buying outdoor gear, choose clothing that doesn't carry Gore-Tex or Teflon tags, and be wary of all fabrics labeled stain-or water-repellent
- Avoid non-stick pans and kitchen utensils — opt for stainless steel or cast iron instead
- Pop popcorn the old-fashioned way, on the stovetop, since microwaveable popcorn bags are often coated with PFCs/PFAS on the inside.
- Choose personal care products without "PTFE" or "fluoro" ingredients; also avoid Oral-B Glide floss, which is made by Gore-Tex

More Tips to Decrease Your Pet's Chemical Exposure

- Provide chlorella to your dogs and cats, which helps remove PFAS from their system. Get additional detox strategies [here](#).
- Filter your pet's drinking water, and yours, to remove contaminants such as PFAS as well as fluoride, chlorine, heavy metals, and others. Household tap water typically contains enough toxic minerals, metals, chemicals, and other unhealthy substances to damage your pet's health long term.

- Minimize exposure to outdoor pollutants and chemicals by keeping your pet away from outdoor areas that are heavily laden with pesticides, herbicides, or fertilizers. If your four-legged family member likes to eat grass or other outdoor greenery, make sure she's not grazing where chemicals have been sprayed.

If you're not sure what your pet may have been exposed to or you suspect something outside is causing skin irritation, do a simple **foot soak** when you bring her home. It can make a dramatic difference in reducing her overall chemical burden. Switch to natural lawn care for your own home.

- Improve your pet's indoor air quality by forbidding smoking in your home and using only nontoxic cleaning products. Avoid **air-scenting products**, which are heavily laden with chemicals and known to cause or worsen respiratory conditions like asthma in both people and pets. Also consider investing in an air purifier to control dust mites.
- Provide an organic, chemical-free pet bed that specifically states it contains all-natural fibers and hasn't been chemically treated.
- Refuse any chemical given once a month on a schedule without discussion (e.g., year-round flea, tick and heartworm pesticides that may be unnecessary), or twice a year in the case of most general dewormers. Do request routine tick-borne disease screening tests and fecal exams. Use **chemical pest and parasite preventives** only when absolutely necessary, and for the minimum time necessary to protect your pet. Look for safe, natural alternatives to monthly chemical preventives.

Sources and References

^{1,5} [Rock, K.D. et al. Environ. Sci. Technol. 2023, 57, 26, 9567–9579, Publication Date: June 20, 2023](#)

^{2,4,9} [Petfood Industry.com, November 9, 2022](#)

³ [ScienceDaily, September 19, 2018](#)

⁶ [ScienceDaily, June 21, 2023](#)

⁷ [NC State University News, June 21, 2023](#)

^{8,10} [Environmental Working Group News, November 3, 2022](#)

¹¹ [American Chemical Society News Release, February 5, 2020](#)

¹² [Ma, Jing et al. Environ. Sci. Technol. Lett. 2020, 7, 3, 135–142 Publication Date: February 5, 2020](#)

¹³ [EWG Guide to Avoiding PFCs](#)
