

Why This Popular Ingredient Doesn't Play Nice with Pet Health

Aside from most varieties being genetically engineered, this food is commonly contaminated with mycotoxins. Beware, these damaging toxins are one of the top reasons for pet food recalls today.

Reviewed by Dr. Becker



STORY AT-A-GLANCE

- Up to 92% of the corn in the U.S. is genetically engineered and carries a heavy glyphosate load — this is the key ingredient in Roundup herbicides and was found to be carcinogenic
- In a 2009 study published in the International Journal of Biological Sciences, rats that were fed genetically engineered (GE) corn were found to develop organ disease after a 90-day feeding trial
- A review of animal and human studies noted that consumption of GE soybean, maize and rice were linked to adverse effects such as cancer or tumor development, decreased learning, reproductive issues and abnormalities in multiple organs
- It's best to omit high starch carbohydrates, including fresh corn, entirely from your dog's and cat's diet. Corn is high in starch and not biologically appropriate for canines and felines
- Corn is also commonly contaminated with mycotoxins, with mold growth occurring before and after harvest

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Dubbed by some as the "world's most important grain," due to its high production volume, corn is a crop with a long history of cultivation, starting with the indigenous people of Mexico 10,000 years ago.¹ And while it is one of the most common foods in most people's diets today, it is also one of the most damaging, for a variety of reasons.

Grains, including corn, should be omitted entirely from your dog's and cat's diet. Due to the high starch (sugar) content, these foods are not biologically appropriate for canines and felines. Keep reading to learn the drawbacks of feeding corn to your pet.

Which States Produce the Most Corn, and How Contaminated Is It?

In the U.S., the highest corn yield comes from the state of Iowa, which produced 2,296,200,000 corn bushels in 2020 — this makes up about 16.19% of the country's overall production. Illinois, Nebraska and Missouri are next on the list. Together, these states make up 54% of the country's corn harvest.²



According to the Center for Food Safety, up to 92% of the corn grown in the country is genetically engineered,³ and according to data from 2012 to 2016, 94.9 million pounds of glyphosate-based herbicide (Roundup) is used on these corn crops annually.⁴



Most Corn in the US Is Sprayed with the Chemical Glyphosate

One of the most pernicious reasons why feeding corn to your pet can be disastrous is that it is genetically engineered and heavily contaminated with Roundup. Roundup is an herbicide produced by the biotech company Monsanto (which was acquired by Bayer in 2018), and its key ingredient is a compound called glyphosate, which kills the weeds it comes in contact with.⁵ An article published by the Louisiana State University (LSU) Agricultural Center summarizes how glyphosate functions:⁶

"Glyphosate works by disrupting the shikimic acid pathway through inhibition of EPSP synthase, which are not found in animals, including humans. The shikimic acid pathway is a metabolic route used in plants and some bacteria, fungi and algae to produce critical amino acids. Glyphosate disrupts biosynthesis of three aromatic amino acids in plants, causing starvation and eventual death."

But because glyphosate — and thereby Roundup — is a non-selective herbicide, it can also kill most plants it comes in contact with. This led to the production of genetically modified crops that were developed to be what's called "Roundup Ready" — meaning they're resistant to Roundup.⁷

However, the problem with glyphosate is it damages the microbiome and is carcinogenic — we'll discuss this more in detail below.

Genetically Engineered Corn Can Harm Your Pet

While there's still need for more research on how GMOs can affect the health of dogs and cats, there's growing research that may shed some light on its potential repercussions.

In a 2009 study published in the International Journal of Biological Sciences, rats that were fed genetically engineered (GE) corn (in the form of GE maize feed) were found to develop kidney and liver disease after a 90-day feeding trial. Other organs, like the spleen and the heart, showed significant damage as well.⁸

In a separate 2009 article, which was released in the journal Critical Reviews in Food Science and Nutrition, about GE foods, the authors noted:^{9,10}

"The results of most of the rather few studies conducted with GM [genetically modified] foods indicate that they may cause hepatic, pancreatic, renal and reproductive effects and may alter hematological, biochemical and immunologic parameters the significance of which remains unknown."

The above results indicate that many GM foods have some common toxic effects. Therefore, further studies should be conducted in order to elucidate the mechanism dominating this action."

Small amounts of ingested DNA may not be broken down under digestive processes and there is a possibility that this DNA may either enter the bloodstream or be excreted, especially in individuals with abnormal digestion as a result of chronic gastrointestinal disease or with immunodeficiency."

A separate 2012 study, also conducted on rats, reported that not only did the test subjects die prematurely, but they also developed kidney and liver issues, as well as mammary tumors after being fed a diet consisting of GE corn.¹¹

In 2016, a study found that feeding GE corn to rats severely damaged the small intestine. The mucosal surface of the intestines responsible for absorbing dietary nutrients became deformed, and the blood vessels became congested. The intestines also showed signs of inflammation.¹²

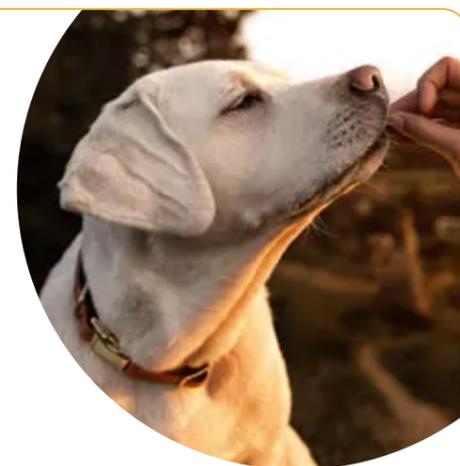
Even though there's still a lot to discover about the potential effects of GE foods on animal companions, it's best to avoid these foods as much as possible. A review of animal and human studies noted that consumption of GE soybean, corn and rice were linked to adverse effects such as cancer or tumor development, decreased learning, reproductive issues and abnormalities in liver, kidney, mammary glands and other organs.¹³



Good News – Pet Owners Are Now Seeking Non-GMO Pet Foods

In a 2017 pet food survey, 65% of the pet owners who responded said they preferred non-GMO ingredients for their pet's food. The survey also noted that 83% of respondents are making an effort to read the label on the pet food products they purchase.¹⁴

In another survey involving 661 dog owners, price was the most crucial attribute, however the ingredient source — "natural, 75/25% organic/non-organic or 100/0% organic/non-organic" — came second.¹⁵



Corn Is Also Contaminated with Mycotoxins and Aflatoxins

Mycotoxins are toxic chemical substances produced by certain types of fungi that infect crops like corn. The name comes from the Greek words for "fungus" and "poison."

The biggest risk of mycotoxin exposure is when feeding pet foods containing corn. In fact, a 2019 study found that 75% of grain-based dry dog food samples tested have been contaminated with mycotoxins.¹⁶ In 2016, a survey found that corn crops had tested positive for mycotoxin contamination, with 90% of corn samples being contaminated with at least one mycotoxin. The three major mycotoxins that were detected in the samples included:¹⁷

- **Deoxynivalenol (DON)** — It is a member of the trichothecenes family of toxins. When ingested, it affects the immune system of animals and may lead to digestive issues like vomiting and diarrhea.¹⁸
- **Fumonisin (FUM)** — When ingested, it can cause organ damage.¹⁹ Horses that are exposed to this toxin develop a fatal disease called equine leukoencephalomalacia (ELEM), or "hole-in-the-head-disease," — it causes the neural tissue of the brain to liquefy.²⁰
- **Zearalenone (ZEN)** — This estrogenic mycotoxin may cause reproductive abnormalities in all animal species.²¹

Crops like corn can be contaminated by mycotoxins if there is mold growth before and after harvest.²² Minimal traces of fumonisins have also been found in sweet corn (4 to 82 parts per billion),²³ so there is still a risk you can be exposed to mycotoxins from the corn you buy in grocery stores, a consideration when preparing a homemade diet.

Aflatoxins are another deadly type of mycotoxin you should be wary of. These naturally occurring mycotoxins are produced by the *Aspergillus flavus* and *Aspergillus parasiticus* fungi. In fact, aflatoxins were responsible for several pet food recalls and disease outbreaks over the past two decades. They are known to cause cancer and acute toxic illness

among humans and pets alike. Aflatoxins are also the no. 1 reason for pet food recalls, with 94% of 2020 pet food recalls occurring because of them.²⁴

In her website, Truth About Pet Food, Susan Thixton lists all the pet food recalls made since 2007, and mycotoxins and aflatoxins account for numerous instances (You can check out her website for more information).²⁵ And just last year, Sportmix pet foods recalled their products after 70 dogs died, while 80 fell ill, after eating aflatoxin-contaminated dog food.²⁶



Did You Know?

Since corn is used in more commercial dog food products than cat food, aflatoxicosis is more common among dogs. So if you're a dog parent, you should be especially vigilant.



Glyphosate in Corn — Harmful to All Life

In humans, glyphosate has been linked to miscarriages,²⁷ premature births²⁸ and non-Hodgkin's lymphoma,²⁹ and can disrupt more than 50% of the microbiome.³⁰ However, there is still very little scientific research specifically on how chronic glyphosate exposure (such as from the diet) can affect companion animals. The good news is new studies are emerging that can help shed light on its toxic effects.

For example, a paper published in 2019 noted that glyphosate has been detected in dogs' and cats' urine.³¹ The researchers found the mean urinary concentration in cats to be twofold higher than in dogs. In addition, exposure doses were two to four orders of magnitude below the current acceptable daily intake for humans.³²

A 2020 analysis that looked at both human and animal studies found that glyphosate causes hemangiosarcoma, kidney tumors and malignant lymphomas in experimental animals (mice and rats).³³ A study published in 2021 also found that glyphosate-based herbicides can influence the production of aflatoxins in crops, which, as discussed above, are toxic to pets and humans alike.³⁴

And while extensive studies on animals have not been conducted, it's clear this chemical affects most mammals, as well as birds and reptiles. There are studies that highlight the effects of this herbicide on animals' microbiome. For example, a study on Hawaiian green turtles found that glyphosate inhibits good bacteria growth, leading to adverse effects on turtle digestion and overall health.³⁵ A separate study showed similar effects, with glyphosate affecting the digestive function of Chinese mitten crabs.³⁶

In fact, glyphosate is toxic to all life. Glyphosate kills beneficial components in soil³⁷ and when it goes into nearby bodies of water, it not only kills aquatic life but also contaminates groundwater and our drinking water supply.³⁸

It even has a significant impact on bee populations, which are declining. Research published in Proceedings of the National Academy of Sciences (PNAS) suggests the chemical may be disturbing the specialized bee gut microbiota that is necessary for proper growth and defense against pathogens.³⁹

There's No Place for Corn (and Other Grains) in Your Pet's Diet

One of the easiest, simplest and most common sense things you can do to maintain your pet's health is to eliminate the toxins from their food, starting with glyphosate-contaminated grains like corn. If you're feeding a fresh, species-appropriate diet, make sure you leave out these ingredients when preparing your pet's meals.

If you're feeding commercial pet food, however, always check the label and study the ingredients in the products you buy. Avoid formulas that contain grain and corn in any form, including corn gluten meal, whole grain corn and corn flour.

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