

Report of FY 2023 Survey of Animal Food Ingredients for PFAS

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that have been used in various consumer, commercial, and industrial products since the 1940s. Due to their ability to resist grease, oil, water, and heat, these chemicals can be found in stain- and water-resistant clothing and carpeting, non-stick cookware, cleaning products, and fire-fighting foams. PFAS do not breakdown easily or quickly and are known to persist in the environment, including in air, water, and soil. There is increasing evidence that these “forever chemicals,” some of which have been linked to serious health effects, bioaccumulate in humans and animals due to their potential presence in food and water. Because of these concerns, FDA’s Center for Veterinary Medicine (CVM) is gathering information to gain a better understanding of the extent of PFAS contamination in food for animals.

During fiscal year 2023, FDA surveyed a limited number of animal food ingredients for the presence of PFAS. We collected samples of plant-based ingredients commonly used in the manufacture of animal food in the U.S. for PFAS analysis. We chose commodities that may be fed to either ruminants or non-ruminants, so as to obtain a broad overview of the presence of PFAS in the animal food supply. We collected samples of corn grain, corn silage, and alfalfa hay from states where these commodities are typically grown. To prevent potential cross-contamination of samples from PFAS-containing equipment, we provided sample collectors with PFAS-free sampling kits, along with additional sample collection instructions.

FDA investigators collected a total of 54 samples across the country and sent them to an FDA laboratory for analysis. Of these 54 samples, 17 were corn grain, 21 were corn silage, and 16 were alfalfa hay. The samples were analyzed using a liquid chromatography with tandem mass spectrometry (LC-MS/MS) method developed and validated by FDA for the determination of 30 PFAS in various human and animal foods. Table 1 contains a list of the 30 target PFAS analytes.

FDA has completed its examination of the sample results. All 30 PFAS analytes were below their respective limits of quantitation (LOQ) in all 54 samples. The LOQ is defined as the lowest level at which quantitative results may be determined with acceptable accuracy and precision.

The primary objective of this survey was to obtain information on the presence of PFAS in certain animal food ingredients to support FDA’s ongoing efforts to learn more about these chemicals. No definitive conclusions can be drawn from this limited survey; however, the results provide FDA with a better idea of the extent of PFAS contamination in certain ingredients used in foods for animals.

Table 1. Thirty target PFAS analytes

TARGET PFAS ANALYTE	ABBREVIATION
Perfluorobutanoic acid	PFBA
Perfluoropentanoic acid	PFPeA
Perfluorohexanoic acid	PFHxA
Perfluoroheptanoic acid	PFHpA
Perfluorooctanoic acid	PFOA
Perfluorononanoic acid	PFNA
Perfluorodecanoic acid	PFDA
Perfluoroundecanoic acid	PFUdA
Perfluorododecanoic acid	PFDoA
Perfluorotridecanoic acid	PFTTrDA
Perfluorotetradecanoic acid	PFTeDA
Dodecafluoro-3H-4,8-dioxanonoate	ADONA
Hexafluoropropyleneoxidedimer acid	HFPO-DA
Perfluoro-1-butane sulfonate	PFBS
Perfluoro-1-pentane sulfonate	PFPeS
Perfluoro-1-hexane sulfonate	PFHxS
Perfluoro-1-heptane sulfonate	PFHpS
Perfluorooctane sulfonate	PFOS
Perfluoro-1-nonane sulfonate	PFNS
Perfluoro-1-decane sulfonate	PFDS
Perfluoro-1-undecane sulfonate	PFUnDS
Perfluoro-1-dodecane sulfonate	PFDoS
Perfluoro-1-tridecane sulfonate	PFTTrDS
9-chlorohexadecafluoro-3-oxanonane-1-	9Cl-PF3ONS
11-chloroeicosafluoro-3-oxaundecane-1-	11Cl-PF3OUdS
1H,1H,2H,2H-perfluorohexane sulfonate	4:2 FTS
1H,1H,2H,2H-perfluorooctane sulfonate	6:2 FTS
1H,1H,2H,2H-perfluorodecane sulfonate	8:2 FTS
1H,1H,2H,2H-perfluorododecane sulfonate	10:2 FTS
Perfluoro-1-octanesulfonamide	PFOSA