

Report of FY 2025 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 break down 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, water, and the environment. Because of these concerns, FDA's Center for Veterinary Medicine (CVM) continues to gather information to gain a better understanding of the extent of PFAS contamination in food for animals.

During fiscal year (FY) 2025, FDA continued its survey of animal food ingredients for the presence of PFAS. This FY 2025 survey included a limited number of plant-based animal food ingredients, specifically soybean meal, dried distillers grains, and hay. These commodities are commonly used in the manufacture of animal food in the U.S. and may be incorporated into the diets of both ruminant and non-ruminant species. Samples were collected across the U.S. between June and September 2025. To prevent potential cross-contamination of samples from PFAS-containing equipment, PFAS-free sampling kits were provided along with sample collection instructions.

A total of 50 samples were sent to an FDA laboratory and analyzed for 28 PFAS analytes. Of these 50 samples, 20 were soybean meal, 20 were a variety of hays (10 Alfalfa, 3 Timothy, and 7 not specified), and 10 were dried distillers grains (6 Corn, 1 Corn-Milo, and 3 not specified), as shown in Table 1. 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 PFAS in various human and animal foods. A list of the 28 target PFAS analytes can be found at the end of this report.

Table 1. Number of Samples Collected and Analyzed by Commodity Type

Commodity Type	Sample Description	Number of Samples Collected and Analyzed
Soybean Meal	N/A	20
Hay	Alfalfa	10
Hay	Timothy	3
Hay	Not Specified	7
Dried Distillers Grains	Corn	6
Dried Distillers Grains	Corn-Milo	1
Dried Distillers Grains	Not Specified	3
Total		50

The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The limit of quantification (LOQ) is defined as the lowest level at which quantitative results may be determined with acceptable accuracy and precision.

FDA has completed its examination of the sample results. Of the 50 samples analyzed, 8 samples had detectable levels of one or more PFAS analytes. The results are broken into two tables: Table 2 reflects the samples that had at least one PFAS analyte quantified above the LOQ, and Table 3 reflects the samples that had at least one PFAS analyte detected above the MDL, but no PFAS analytes detected above the LOQ.

PFAS were quantified at levels above the LOQ for at least one PFAS analyte in 2 samples of hay as shown in Table 2. One of these hay samples had additional PFAS detected at levels above the MDL, but below the LOQ.

Table 2. Samples with PFAS Detected Above the Limit of Quantitation

Sample Description	PFHpA	PFOA	PFBS	PFPeS	PFHxS	PFOS	8:2 FTS
MDL (ppt)	27	30	29	32	31	28	49
LOQ (ppt)	110	120	120	130	130	120	206
Hay (Alfalfa)	<i>34</i>	<i>49</i>	1297	93	270	36	<MDL
Hay (Timothy)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	740

Measured concentrations are in parts per trillion (ppt = ng/kg).

Samples were analyzed on an “as received” basis.

Results below the MDL are reported as <MDL.

Trace values (those greater than the MDL and less than the LOQ) are reported in italics.

Six additional samples had PFAS detected at trace levels, or levels that are greater than the MDL and less than the LOQ, as shown in Table 3.

Table 3. Additional Samples with PFAS Detected at Trace Levels (Above MDL but Below LOQ)

Sample Description	PFHxA	PFOA	PFBS	PFHxS	PFOS
MDL (ppt)	65	30	29	31	28
LOQ (ppt)	270	120	120	130	120
Hay	<MDL	<MDL	75	<MDL	70
Hay	<MDL	37	<MDL	<MDL	30
Hay (Alfalfa)	<MDL	30	114	<MDL	<MDL
Soybean Meal	69	<MDL	<MDL	<MDL	<MDL
Soybean Meal	84	<MDL	<MDL	<MDL	<MDL
Dried Distillers Grain (Corn)	<MDL	<MDL	<MDL	31	<MDL

Measured concentrations are in parts per trillion (ppt = ng/kg).

Samples were analyzed on an “as received” basis.

Results below the MDL are reported as <MDL.

Trace values (those greater than the MDL and less than the LOQ) are reported in italics.

The primary objective of this survey was to obtain additional information on the presence of PFAS in certain plant-based ingredients commonly used in animal food. In FY23 and FY24, FDA collected and analyzed samples of hay for PFAS as it is known to be able to take up these compounds. This FY25 survey, however, marks the first time FDA has collected samples of soybean meal and dried distillers grains for PFAS analysis. While no definitive conclusions can be drawn from this limited survey, the results provide FDA with additional data on the presence of PFAS in certain animal food ingredients.

Table 4. Twenty-eight target PFAS analytes

TARGET PFAS ANALYTE	ABBREVIATION	MDL (ppt)	LOQ (ppt)
Perfluorohexanoic acid	PFHxA	65	270
Perfluoroheptanoic acid	PFHpA	27	110
Perfluorooctanoic acid	PFOA	30	120
Perfluorononanoic acid	PFNA	36	150
Perfluorodecanoic acid	PFDA	43	180
Perfluoroundecanoic acid	PFUdA	36	150
Perfluorododecanoic acid	PFDoA	35	150
Perfluorotridecanoic acid	PFTTrDA	36	150
Perfluorotetradecanoic acid	PFTeDA	31	130
Dodecafluoro-3H-4,8-dioxanonoate	ADONA	34	140
Hexafluoropropyleneoxidedimer acid	HFPO-DA	33	140
Perfluoro-1-butane sulfonate	PFBS	29	120
Perfluoro-1-pentane sulfonate	PFPeS	32	130
Perfluoro-1-hexane sulfonate	PFHxS	31	130
Perfluoro-1-heptane sulfonate	PFHpS	38	160
Perfluorooctane sulfonate	PFOS	28	120
Perfluoro-1-nonane sulfonate	PFNS	32	130
Perfluoro-1-decane sulfonate	PFDS	29	120
Perfluoro-1-undecane sulfonate	PFUnDS	23	96
Perfluoro-1-dodecane sulfonate	PFDoS	24	99
Perfluoro-1-tridecane sulfonate	PFTTrDS	29	120
9-chlorohexadecafluoro-3-oxanonane-1-	9Cl-PF3ONS	25	100
Perfluoro-1-octanesulfonamide	PFOSA	30	120
11-chloroeicosafluoro-3-oxaundecane-1-	11Cl-PF3OUdS	26	110
1H,1H,2H,2H-perfluorohexane sulfonate	4:2 FTS	50	210
1H,1H,2H,2H-perfluorooctane sulfonate	6:2 FTS	NR	620
1H,1H,2H,2H-perfluorodecane sulfonate	8:2 FTS	49	206
1H,1H,2H,2H-perfluorododecane sulfonate	10:2 FTS	417	1700

NR = Not Reported