Investigation of PFAS Exposure via Drinking Water and Diet in Parchment and Cooper Township

129 Participants:
Blood draw (100)
Wristband (87)

92 Homes:
Water (42)
Air & Dust (32)

24 Gardens:
Produce (62)
Soil (31)

Animal Products:
Eggs (2)
Venison (3)

This report provides an overview of the updated blood and water results for the study. Your individual results are at the end of this packet. These will include water results if your water was re-sampled this July and/or blood results if you had a blood draw and did not get your results in June.

Overview Summary:

Water: Current PFAS levels in public water are much lower than when the contamination was first discovered in 2018. All public samples were below the maximum level allowable in Michigan public water supplies. Some water samples exceeded EPA's new health advisory. We identified a number of PFASs that were not previously investigated (5 in public water and 9 in private wells). *While less is known about these other PFASs, it is advisable to limit exposure until health-based guidelines are established. See the enclosed fact sheets for guidance on water filtration.*

Blood: Average PFAS blood levels were notably elevated compared to the general population and are consistent with the PFASs that were historically elevated in drinking water. This was expected because of the high PFAS levels in the water and because PFAS stay in blood for many years. People with higher PFAS blood levels, on average across the population, are more likely to have certain health effects (e.g., high cholesterol, certain cancers (e.g., kidney and testicular), thyroid disorders, pregnancy induced hypertension). Levels of PFAS in blood do not directly predict an individual's likelihood to develop disease since individual risk varies depending on genetic, dietary, and other environmental factors. However they can inform exposure reduction efforts and be used as a risk factor to inform patient care. *See the enclosed fact sheets for guidance on exposure reduction and medical screening.*

Home Gardens: We identified many PFASs in produce and soil from home gardens. There are currently no federal or state guidelines for PFAS in produce or garden soils. We are currently estimating exposure and risk based on our results and will share when they are ready. *Washing produce with a food safe method can help reduce intake of PFAS as well as other possible contaminants in soil like lead.*

Home Produced Eggs and Local Venison: We identified elevated levels of PFOS in these foods. In the absence of guidance for these specific foods we compared to guidance values for fish consumption. *Concentrations in eggs are near the recommendation to eat no more than once a week and for venison to eat no more than once a month.* We are currently estimating exposure and risk based on our results and will share when they are ready.

What's happening next with the study?

Recording: You can view our report-back video online:

Virtual Community Meeting: You're invited to a virtual community meeting on Tuesday October 18th at 6 PM where we will share overall findings, respond to questions, and facilitate discussion. It's easy to join by land-line, cell phone, tablet or computer. See the enclosed sheet for call details.

Community Advisory Board: You're invited to join our community advisory board, which meets once a month via phone/zoom. Please reach out to our study team for more details.

Follow-up Questionnaire: Please and return the enclosed questionnaire, which is an important part of the study. It takes about 10 minutes and we'll send a $20 gift card to Meijer as thanks. Alternatively you can text or email us and we can set up a time to ask you the questions by phone or zoom, or can send you a link to complete it electronically.

Food: We are estimating exposure and risk based on our results and will share when they are ready. We are collecting and analyzing eggs from homes with chickens for a limited time upon request.

Wristbands, Indoor Air and Dust: These samples are currently being analyzed for PFAS. Overall results will be shared once available.

Finger-prick test: We compared PFAS results from the blood draw with a new commercial finger-prick test and found it works well for individuals who want to know their blood level. Anyone can order a kit online from EmpowerDX at https://empowerdxlab.com/products/product/pfas-exposure-test.

Drinking Water and Diet: We are using all the study information and results to estimate the relative contribution of drinking water and diet to PFAS exposure for our study participants. Similar estimates will be done to better understand exposure to PFAS from consumer and personal care products.

Immune Function: We are testing blood samples to understand more about the effects of PFAS on the immune system and will share results when they are ready.

Where can I find more Information?

The **PFAS-Exchange** Website is an online resource develop for PFAS impacted communities. You can visually compare your results to the general population using the What's My Exposure Tool. Visit the Connecting Communities page to connect with other communities and groups working on PFAS issues and to see a map of PFAS sites across the country. Fact sheets available on the resource page include guidance on PFAS health effects, exposure reduction, water testing and filtration, blood testing, and medical screening. There's are also useful links to other resources like a water-blood prediction tool. Bring your questions to the virtual community meeting and we can figure things out together.
https://pfas-exchange.org

Tap Water

Water samples were collected from 2020-2021 and analyzed using a new method to look for 48 different PFAS compounds. While the new method was able to identify other PFAS not previously found it was not sensitive to legacy PFAS (e.g., PFOA and PFOS) for about half of the samples. We offered to re-sample and test those homes. 12 homes requested and were re-sampled in July 2022; these were analyzed to look for 72 different PFAS compounds. **If your home water was re-sampled this year, your individual results are at the end of this packet.**

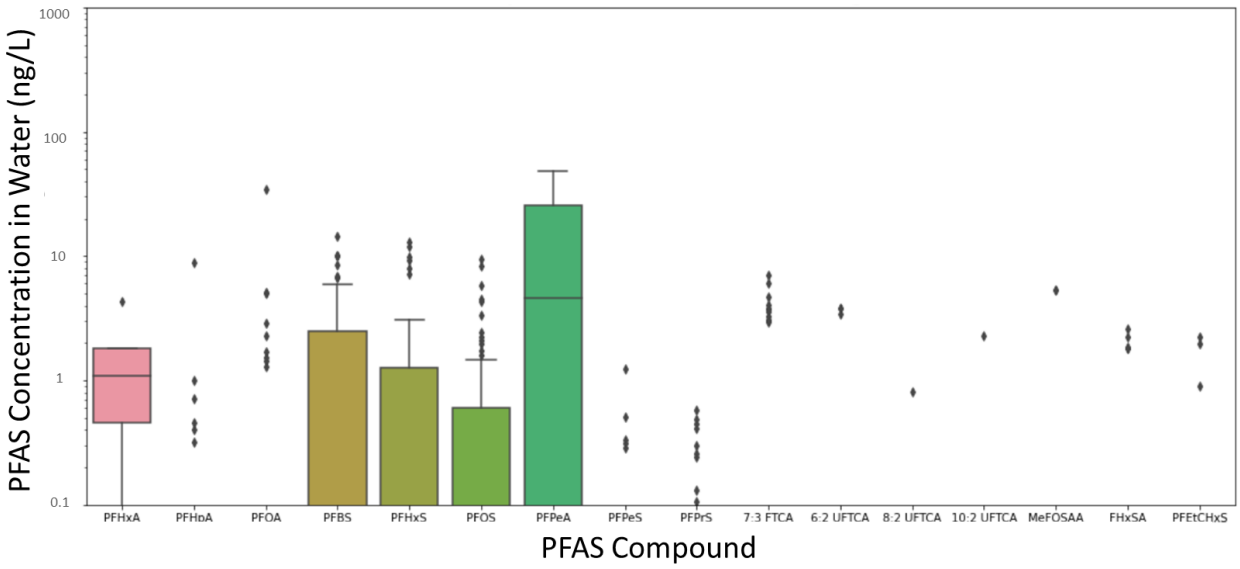
Public water: Samples were collected from 8 homes in Parchment and Cooper Township on Kalamazoo public water. Six homes were sampled in 2020, two were sampled in 2021 and five were re-sampled in 2022. Results are reported in ng/L (nanograms of PFAS per liter of water), also known as parts per trillion (ppt) or the mass of PFAS in your water per trillion units of water.
Current levels are much lower than when the contamination was first discovered in 2018. 75% of samples didn't contain detectable PFOA or PFOS, and two samples collected in 2021 contained low levels. PFBS was found at low concentrations in all samples. All concentrations were below the maximum level allowable in Michigan public water supplies but some exceeded EPA's new health advisories for PFOA (0.004 ng/L) and PFOS (0.02 ng/L).

	Public Water (2020-2022)					Maximum Level Allowed in Michigan Public Water Supplies[b]	Historic Results for Parchment Public Water Supply (June 2018)
	Detection Frequency[a]	25th Percentile	Average (Median)	75th Percentile	Maximum		
Total PFAS	95%	14.1	25.1	68.3	193.4	--	1600
Total PFOA and PFOS	53%	-	1.7	2.0	6.0	--	1410
Individual PFAS							
PFOA	37%	-	-	1.6	2.6	8	670
PFOS	53%	-	1.7	3.0	4.5	16	740
PFHxS	37%	-	-	2.2	3.4	51	19
PFHxA[1]	100%	1.5	1.8	1.9	2.0	400000	49
PFHpA	26%	-	-	0.7	0.9	--	96
EtFOSAA	0%	-	-	-	-	--	13
PFNA	0%	-	-	-	-	6	6
PFBS	79%	0.2	3.8	10	13	420	7
PFPeS[1]	26%	-	-	0.5	0.7	--	NA
FOSA[2]	67%	-	1.2	1.7	1.8	--	NA
PFODA	5%	-	-	-	4.5	--	NA
PFBA	37%	-	-	3.1	65	--	NA
PFPeA	68%	-	2.3	23	164	--	NA
PFPrA[2]	100%	11.0	14.5	16	17	--	NA
PFPrS	32%	-	-	0.4	0.6	--	NA
8:2 FTS	5%	-	-	-	1.1	--	NA

- Not detected above the reporting limit
-- No standard available
NA: PFAS compound not analyzed. Used a standard method to look for 14 different PFAS compounds and found 8.
[1]Detection limits for PFHxA and PFPeS were previously not sensitive so summary statistics are restricted to the 2022 sampling.
[2]These PFASs were added to the panel for the 2022 re-sampling so summary statistics are restricted to the 2022 sampling.
[a]Detection Frequency: Percent of samples detected in above the reporting limit
[b]Michigan Maximum Contaminant Level (MCLs): Legal allowable level for public water supplies in Michigan.

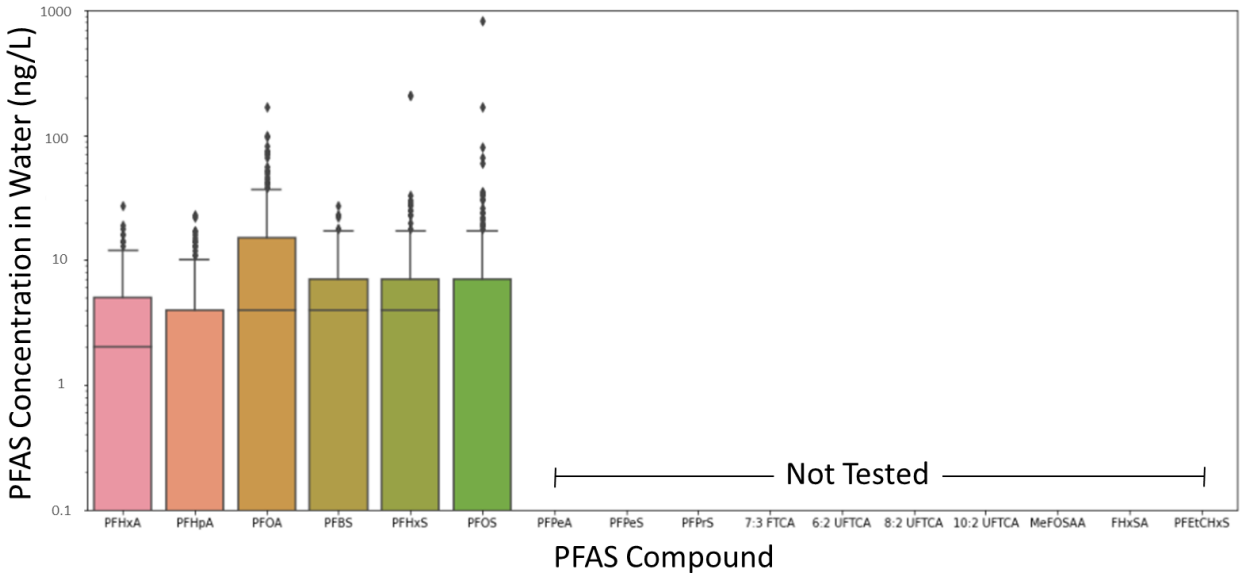
Private wells: Water samples were collected from 2020-2021 from 34 homes with private wells, after most homes with high levels had been connected to public water. PFBS, PFHxS and PFOS were found in water from many homes. Average concentrations were very low (below 0.1 ng/L or ppt) but ranged into the double digits. 13 other PFAS compounds were above the detection limit in one or more sample. Elevated concentrations of PFPeA were likely a laboratory contaminant in the 2020-2021 results, with true concentrations less than 10 ng/L. A few samples exceeded Michigan's public water guidelines (MCL) and many samples exceeded EPA's new health advisories.

Water samples collected by our study in 2020-2022 from homes with private wells



Historic**:** Water results from private wells sampled in 2018 by the state were much higher than for wells sampled in our study with average concentrations of <1 to 3 ng/L (or ppt) and ranging well into the hundreds. 6 of the 14 PFAS compounds investigated at the time were above the detection limit in most samples.

Water samples collected by the state in 2018 from homes with private wells



What do the water results mean?

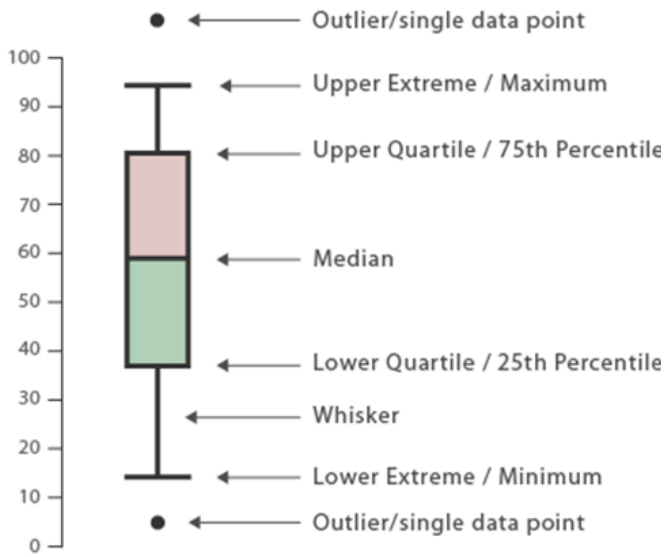
Additional monitoring of the public water supply to also look for a larger number of PFAS compounds could help identify additional PFAS that may be present. If any PFAS was detected in your water above Michigan's guidelines for public water (MCLs) we recommend filtering your water.

EPA's new health advisories for PFOA and PFOS are purely health based, meaning they do not consider feasibility, and are below current typical detection limits (0.004 ng/L for PFOA and 0.02 ng/L for PFOS). EPA's Health Advisory Fact Sheet: https://www.epa.gov/system/files/documents/2022-06/drinking-water-ha-pfas-factsheet-communities.pdf

MCLs are not available for all PFAS, which can make interpretation difficult. Some states have proposed lower MCLs for some PFAS. You can compare your results to MCLs from other states using the 'What's My Exposure' tool on the PFAS Exchange website: www.pfas-exchange.org.

If PFAS was detected in your water, you may consider using a water filter in your home to further reduce your exposure to PFAS. Enclosed is a fact sheet that discusses the different types of water filters and their effectiveness at reducing PFAS.

How to read a box plot



The middle line shows the 50th percentile (concentrations for up to half of homes) and the top of the bar shows the 75th percentile (concentrations for up to ¾ of homes).

The T-shaped bars show where most of the rest of the values fell

The dots show individual results.

If no middle (median) line is shown that means the PFAS compound was detected in less than half of all samples.

If no upper quartile bar is shown that means the PFAS compound was only detected in less than 25% of samples. Concentrations for those samples are represented by a T-shaped bar and/or dots.

Units:

Levels in water are reported as ng/L, which is parts per trillion (ppt) or the mass of PFAS per trillion units of water.

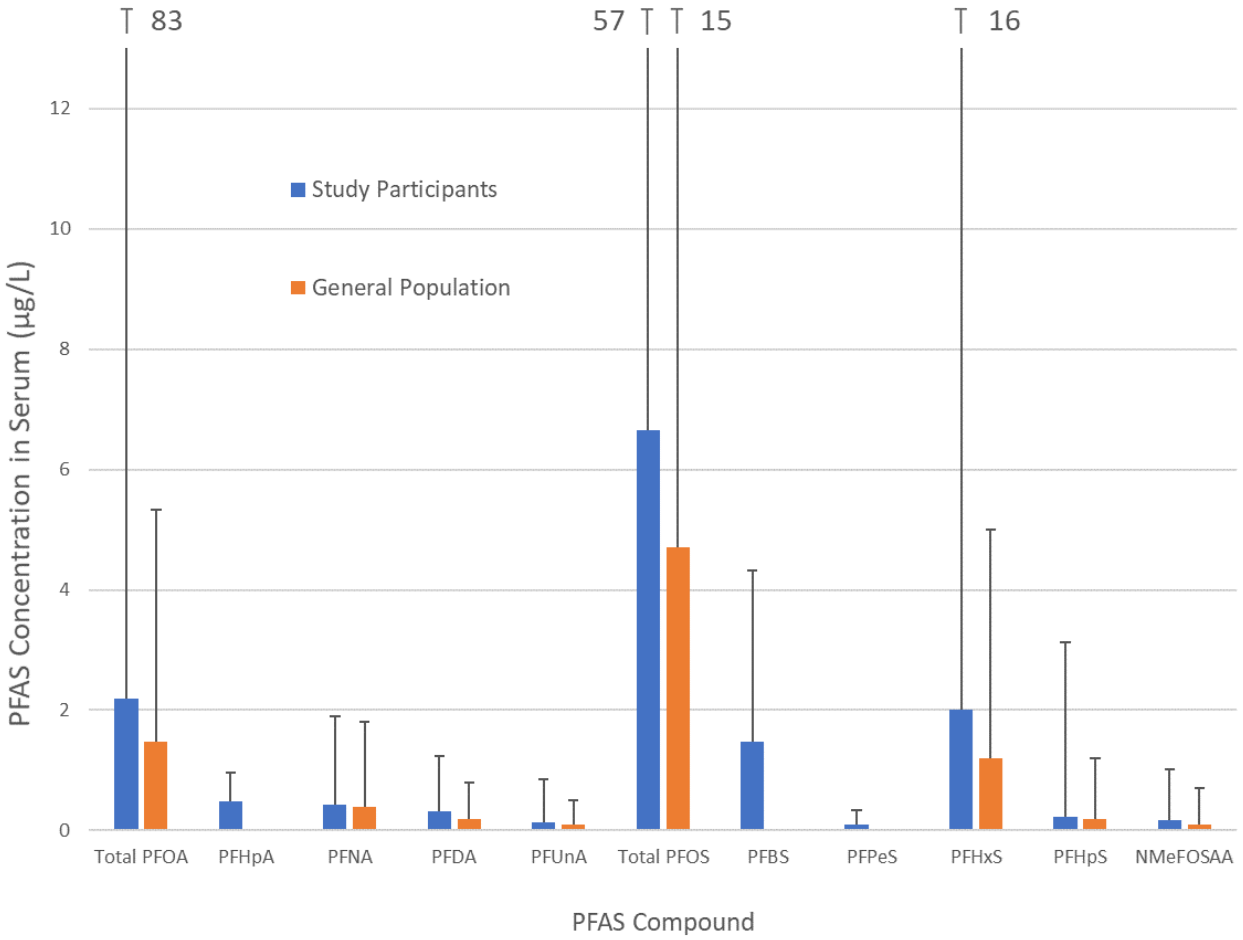
Levels in blood are reported as µg/L (or ng/mL), which is parts per billion (ppb) or the mass of PFAS per billion units of blood (serum).

Levels in food are reported as ng/g, which is parts per billion (ppb) or the mass of PFAS per billion units of food (in wet weight).

Parts per billion (ppb) is 1,000 units more than parts per trillion (ppt): 1 ppb = 1,000 ppt.

Blood (Serum)

Blood samples were collected from 100 participants between 2020-2021 and analyzed for 34 different PFAS compounds. We detected up to 23 PFAS compounds in serum from our study participants. Levels were generally higher than measured in the U.S. population, and most are considered elevated with respect to clinical guidance. Medians for PFOS, PFOA and PFHxS were an average of 6.6, 2.1 and 2.0 ppb (µg/L) higher, respectively, than the general population. Four PFAS not investigated in the general population were found in a majority of participants (PFBS, PFPeS, PFHpS and NMeFOSAA). As almost all of our participants were adults we compared with the adult U.S. population using the most recent (2017-2018) data available from the National Health and Nutrition Examination Survey for those PFASs found in most samples.



T bars indicate the 95th percentile, or near maximum, of the data set. Some values were higher than the scale shown, so are written next to each T bar.

What do these results mean to your health?

Higher exposure to certain PFAS chemicals have been linked with a number of health effects, outlined in the enclosed medical screening guidance documents. Individual risk varies depending on genetic, dietary, and other environmental factors. Therefore, at the same exposure level one person may develop a disease whereas another may not. On the next page is a useful figure from the National Academies new guidance for clinicians of patients with blood test results. Concentrations from 2-20 µg/L (2-20 ng/mL) are moderately elevated and concentrations above 20 µg/L (20 ng/mL) are notably elevated. A history of elevated PFAS exposure can be used by clinicians as a risk factor to inform patient care, therefore it may be useful to discuss with your doctor during your next visit.

What are limitations of the PFAS blood sampling results?

These results tell you how much PFAS was present in your blood on the day you provided a sample.

Many of the PFAS we measured stay in your body for several years, so the levels that we measured also reflect your exposure in the past.

While most PFASs in blood reflect historically elevated levels in water, we identified some PFAS in blood that were not in the water. This was expected given their widespread use and we are working to identify other possible sources (e.g., diet, occupation, product use, indoor environment) using data from this study.

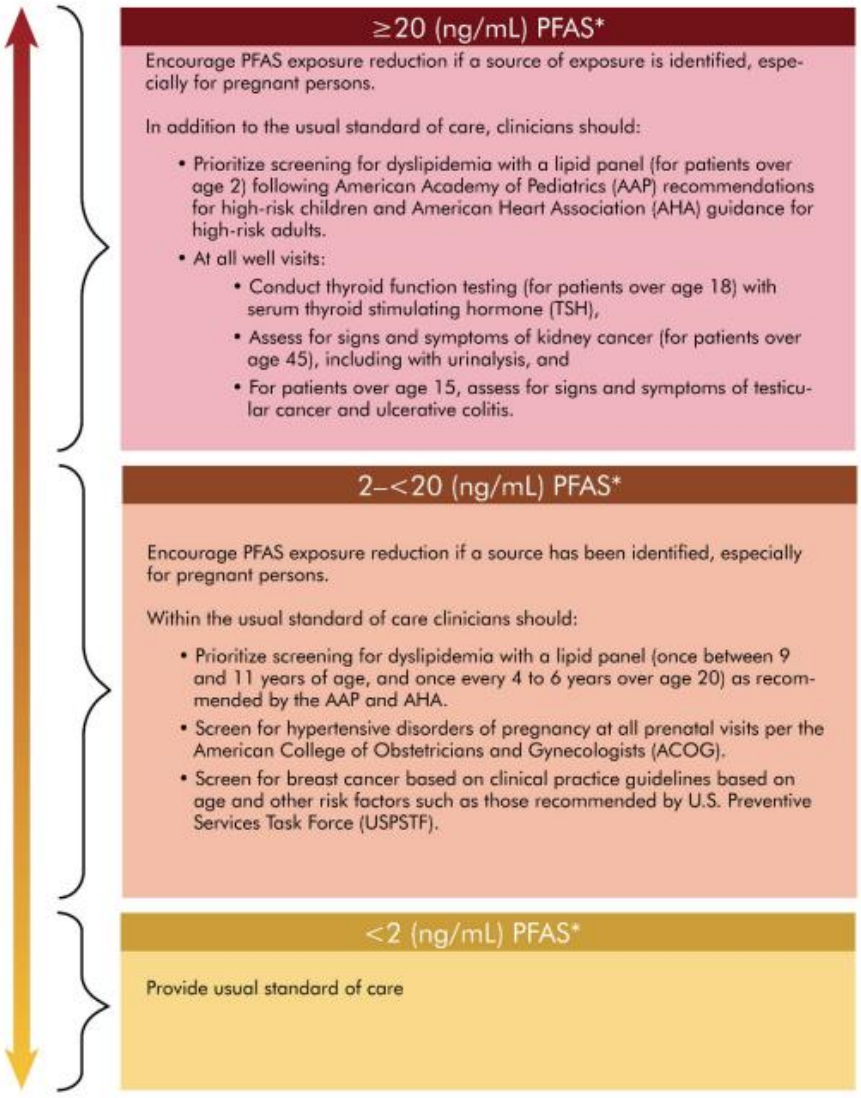
How can I reduce my PFAS blood levels?

Limiting ongoing exposure will help your blood levels come down over time. Access to cleaner drinking water is an important first step – your blood levels have likely already begun to decline. Diet and the indoor environment are believed to be leading sources of exposure for the general population. While fish have healthy fatty acids (omega 3) they can also be a source of PFAS exposure, especially from contaminated rivers and lakes. We have found that home gardens, home produced eggs and local venison may be dietary sources of PFAS in your community. Compost made from biosolids or other PFAS containing waste may be problematic. Stain and water-resistant sprays can be a large source of exposure when applied but will continue to be released from the product for many years, including pre-treated carpets and upholsteries. Other notable sources of exposure may include make-up and anti-fog spray for glasses.

Where can I find more information and resources?

The **PFAS-Exchange** is an online resource develop for PFAS impacted communities. You can visually compare your results to the general population using the What's My Exposure Tool. View a PFAS map on the Connecting Communities page. The resource page has fact sheets on PFAS health effects, exposure reduction, water testing and filtration, blood testing, and medical screening plus a link to a water-blood prediction tool. **https://pfas-exchange.org**

Clinical Guidance for Follow-up with Patients after PFAS Testing



* Simple additive sum of MeFOSAA, PFHxS, PFOA (linear and branched isomers), PFDA, PFUnDA, PFOS (linear and branched isomers), and PFNA in serum or plasma

FIGURE S-6 Clinical guidance for follow-up with patients after PFAS testing.
NOTE: MeFOSAA = methylperfluorooctane sulfonamidoacetic acid; PFDA = perfluorodecanoic acid; PFHxS = perfluorohexane sulfonic acid, PFNA = perfluorononanoic acid; PFOA = perfluorooctanoic acid; PFOS = perfluorooctanesulfonic acid; PFUnDA = perfluoroundecanoic acid.

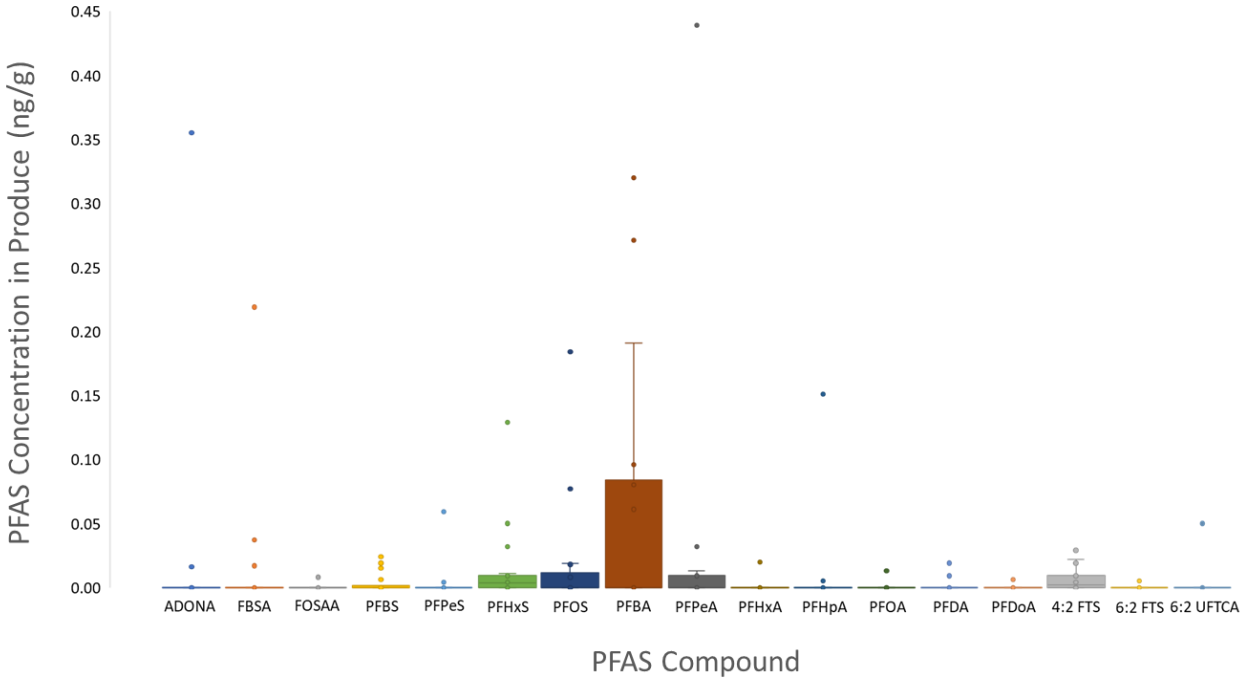
Find the full report accompanying this figure for free online at: https://doi.org/10.17226/26156. National Academies of Sciences, Engineering, and Medicine. 2022. Guidance on PFAS Exposure, Testing, and Clinical Follow-Up. Washington, DC: The National Academies Press.

Food and Soil

Food and soil samples were collected from 27 homes during the growing season of 2020 and 2021 and analyzed using new methods for 48 different PFAS compounds. Results are reported in ng/g (nanograms of PFAS per gram of sample), also known as parts per billion (ppb).

Produce collected from home gardens included tomatoes, peppers, green beans, cucumbers, lettuce, kale, cabbage, herbs, squash, carrot, potato, pears, peaches, and berries. Samples were combined by home or food type to reduce analytical cost.

17 different PFAS compounds were identified in the samples and all samples had at least one PFAS compound. Levels were similar to two other communities with contaminated water in Minnesota and North Carolina with concentrations below 0.5 ppb (ng/g) for most PFAS compounds. PFHxS and 4:2 FTS were in more than half of the produce samples tested. PFBS, PFOS, PFBA, PFPeA were found in more than 30% of the produce samples. Other PFAS chemicals were detected at lower concentrations.

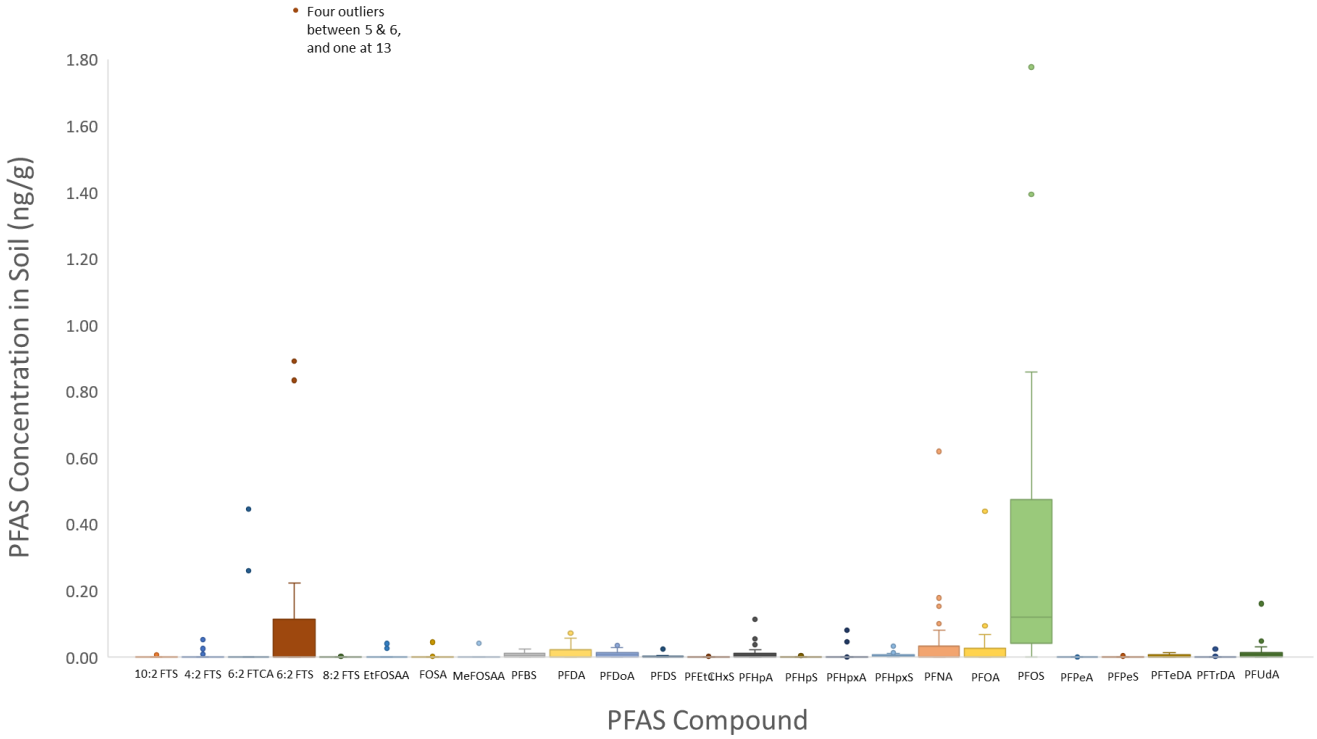


There are currently no federal or state guidelines for PFAS in food. We are currently estimating exposure and risk from eating these home grown produce and will share results when they are ready, likely early next year. We also plan to generate and share information about different types of produce as well as research on soil amendments to reduce plant uptake of PFAS.

Soil was collected from raised bed, in ground, and potted home gardens. Soils were tested individually by each home and soil type.

25 different PFAS compounds were identified in the samples and all samples contained PFOS, which had a median concentration of 0.12 ppb and ranged up to 1.8 ppb. PFOA was found in only 40% of samples at concentrations ranging up to 0.44 ppb. The median concentration of PFOA + PFOS was 0.12 ppb and ranged up to 2.22 ppb.

6:2 FTS was detected in only 30% of samples but found at the highest concentrations in soil, ranging up to 12.5 ppb. PFHxS, PFBS, PFHpA, PFDoA, PFUdA, and PFDA were found in 90, 77, 71, 68, 65, and 48% of samples, respectively. The remaining compounds were detected in less than 40% of samples.



We also collected and tested soil from three undeveloped ‘background’ locations in Parchment and Cooper Township and found no detectable levels of PFAS.

There are currently no federal or state guidelines for PFAS in garden soil. None of the soil samples exceeded the residential garden soil screening values issued by the Australian Department of Environment and Energy (9 ng/g for PFOS+PFHxS and 100 ng/g for PFOA). Since those screening values are for the general population we are working to understand whether lower soil screening levels may be advisable for people with elevated blood levels of PFAS and will share that information once available, likely early next year.

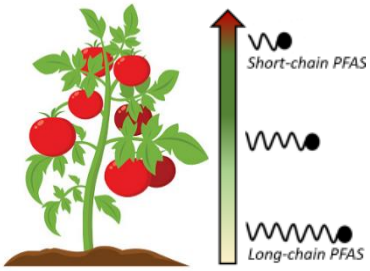
What do the produce and soil results mean?

Our findings are consistent with other studies showing less uptake of long-chain PFAS like PFOA and PFOS into produce, whereas shorter-chain PFAS are taken up more readily. It is currently not clear why PFBS was more prevalent in produce than in the soil or water.

There are currently no federal or state guidelines for PFAS in produce or garden soils. We are estimating exposure and risk based on our results and will share when they are ready.

Practical Interim Guidance for Home Gardens:

There are benefits from growing and eating local, homegrown, and caught foods. However, locally raised, grown, or caught foods can be sources of PFAS exposure at impacted sites.



Source: Wisconsin Department of Health

PFAS can enter garden soils through irrigation with contaminated water and/or application of contaminated compost. Short-chain PFAS (e.g., PFBS) are taken up by produce more readily than long-chain PFAS (e.g., PFOA, PFOS). Leafy greens, tomatoes and berries take up PFASs more readily. This is thought to be due to their higher water content. Soil on root vegetables can be another dietary source of PFAS.

While levels of PFAS in garden soil or irrigation water that are “safe” to use for growing fruits and vegetables are not known, there are some actions you can take to reduce your exposure to PFAS from your home garden:

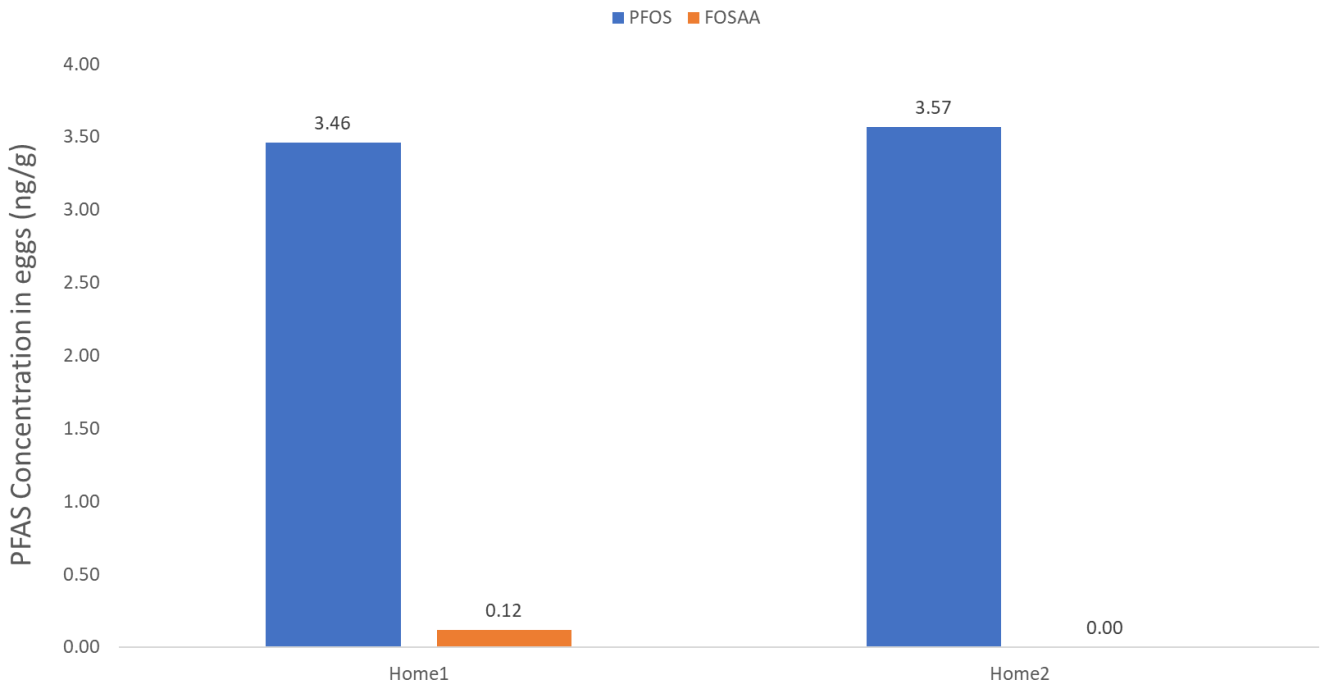
- Assure that the water used to irrigate your garden has the lowest possible levels of PFAS, if feasible. This will be the most effective option.
- Bring in clean soil and create raised beds, ensuring the roots of your plants do not extend past the clean soil, underlaid with heavy-duty landscape fabric (polypropylene is a good choice).
- Add high organic carbon sources like compost, peat and manure that do not contain PFAS to garden soil. This has been reported to reduce PFAS uptake into plants. Avoid compost made with biosolids or paper food packaging waste, which can contain PFAS.
- Only safe drinking water should be used for preparing, cooking, or preserving foods.
- Wash all produce in clean water and peel or scrub root vegetables before eating.
- Wear gloves and wash hands after gardening and before eating. Avoid eating food, drinking, or smoking when working with garden soil to prevent the potential transfer of contaminated soil to your mouth. Take care not to track dirt from the garden into the house.

At this time, no government or other authoritative body has identified “safe” levels of PFAS in either commercially grown, local or homegrown foods, nor are PFAS concentrations regulated in food. We are currently estimating exposure and risk for people in your community from homegrown produce that will be tailored to the elevated PFAS blood levels.

Eggs were collected from two homes with chickens within a few days of being laid. PFOS was found in eggs collected from both homes at close to the same concentration (3.5 ng/g). One other PFAS (FOSAA) was also found in one of the eggs, at a much lower concentration (0.12 ng/g).

We are currently estimating exposure and risk based on our results and will share when they are ready. There are currently no federal or state guidelines for PFAS in eggs however these concentrations are potentially concerning as they fall within existing guidance for fish. See page 14 for additional context.

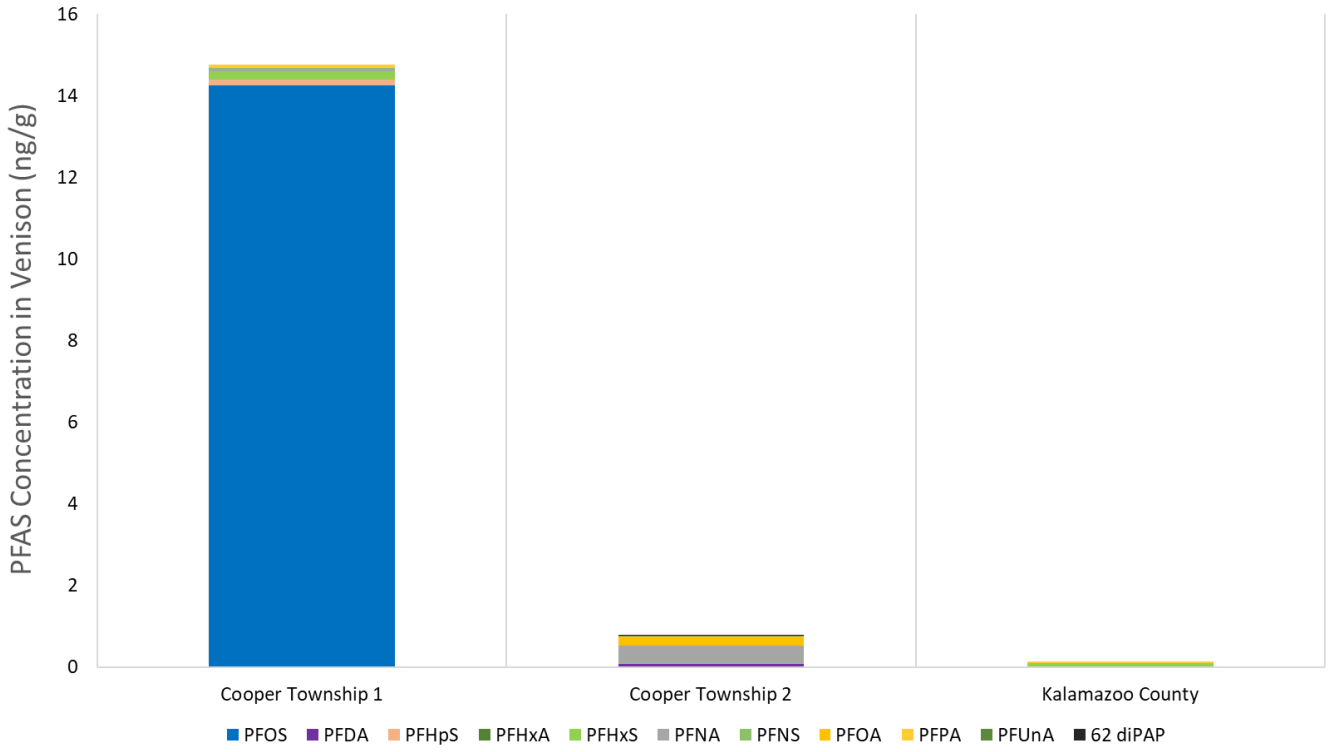
We are offering additional egg testing. If you have home produce eggs to test please let us know.



Venison was collected from three homes. Two of the deer were caught in Cooper Township and a third elsewhere in Kalamazoo County. PFOS was notably elevated (14 ng/g) in one of the deer caught in Cooper Township whereas PFNA and PFOA were somewhat elevated in the other. The deer caught elsewhere in Kalamazoo County had lower levels.

This is only a few samples so it is difficult to make broad conclusions. The State of Michigan has been notified and is considering doing more testing.

We are currently estimating exposure and risk based on our results and will share when they are ready. There are currently no federal or state guidelines for PFAS in deer however these concentrations are potentially concerning as they fall within existing guidance for fish. See page 14 for additional context.



Fish: We plan to estimate exposures to PFAS from fish using dietary information from our study questionnaires along with PFAS concentrations in fish measured and reported by the state of Michigan. We will share that information and results when they are ready, likely sometime next year. There is currently a Do Not Eat advisory for fish in the Kalamazoo River. Current fish advisories can be found on Michigan's Eat Safe Fish website. Fish in the Great Lakes have generally been found to contain higher levels of PFAS compared to ocean-caught fish.

https://www.michigan.gov/mdhhs/safety-injury-prev/environmental-health/topics/eatsafefish/guides

Context for egg and venison results:

There are currently no federal or state guidelines for PFAS in eggs or venison. However, guidelines are available for fish from Michigan and New Jersey. These are provided in the tables below and can be useful for context. Please note that the states currently have different guidance because they use different approaches in deriving those values and that guidelines are made for the general population. We are sharing the New Jersey guidelines because they are currently the lowest of all the states. Please be aware that guidelines across the states may change in the coming years and that no guidelines have been made specifically for people with a history of elevated PFAS exposure.

Eggs: Our findings are consistent with other studies showing that chickens exposed to PFOS can have elevated levels in their eggs. Concentrations of PFOS in eggs (3.5 ng/g) are near New Jersey's recommendation for fish to eat a serving no more than once a week (four times a month).

** Please let us know if you have home produce eggs that you would like us to test.**

Venison: Our findings are consistent with other studies showing that venison can contain elevated levels of PFOS in areas with environmental contamination. The concentration of PFOS in one of the venison samples (14 ng/g) is near the New Jersey recommendation to eat no more than one meal per month. The concentration of PFNA (0.42 ng/g) in the other venison sample fell above New Jersey's guideline for unlimited consumption, which means they recommend somewhat limiting consumption.

Fish Consumption Guidelines to Provide Some Context for Concentrations in Food (PFAS units: ng/g)

Meal Category *meals per month* [a]	Michigan[b] PFOS	Meal Category	New Jersey[c] PFOS	PFOA	PFNA
		Unlimited	< 0.56	0.62	0.23
16	≤ 9				
12	>9 to 13				
8	>13 to 19				
4	>19 to 38	Weekly	>0.56 to 3.9	>0.62 to 4.3	>0.23 to 1.6
2	>38 to 75	Monthly	>3.9 to 17	>4.3 to 18.6	>1.6 to 6.9
1	>75 to 150	4 meals/year	>17 to 51	>18.6 to 57	>6.9 to 21
6 meals/year	>150 to 300	Yearly	>51 to 204	>57 to 226	>21 to 84
Do Not Eat	>300	Do Not Eat	>204 (>17*)	>226 (18.6*)	>84 (>6.9*)

[a] Meal categories are in months unless otherwise stated. Blank spaces indicate a value was not provided.

[b] Michigan Fish Consumption Guidelines: Are based on the 2014 MI Health Consultation using the relevant reference dose at the time and assumes 227g (8oz) meal size and a 80kg (176 lbs) body weight.
michigan.gov/documents/mdch/MFCAP_Guidance_Document_500546_7.pdf

[c] New Jersey Fish Consumption Guidelines: Are based on the same reference doses used by NJ for drinking water criteria and assume 227 g (8 oz) meal size and 70 kg (154 lbs) body weight.
state.nj.us/drbc/library/documents/TAC/06182019/PFAS_Njsediment-fish-water_Goodrow_NJDEP.pdf

*High risk individuals including infants, children, pregnant women, nursing mothers and women of child bearing age.

We created this table using information from the two guidance documents and lined up the different meal categories. Blank spaces indicate there is no guidance from that state for that category.

Study Overview:

- 129 people enrolled in the study from 92 homes in Parchment and Cooper Township.
- Samples were collected from participant homes from 2020-2021 and blood draws were done in 2021.
- Water samples were collected from 34 homes with private wells and 8 homes on Kalamazoo public water. Sampling occurred after most homes with the highest levels in their wells were connected to public water. An additional 12 homes were re-sampled in July of this year (2022).
- Home grown foods were collected from 24 homes and included leafy greens, cruciferous, nightshade, squash, fruit, root vegetable, and eggs. Soil was collected from each sampled garden. Eggs were collected from 2 homes and deer venison from 3 homes.
- 100 participants did the blood draw and 53 also did the fingerprick microsample. This report includes results for all 100 participants. Urine samples have not been analyzed but have been stored in case needed in the future.
- 87 participants wore and returned the wristband. Air and dust were collected from 32 homes. Samples are currently being analyzed for PFAS and we will share overall results when available.
- 48 different PFASs including PFOA and PFOS were tested in the samples. Hundreds of PFASs were investigated using non-targeted suspect screening for a subset of water and soil samples.

Study Timeline: