



**Testimony of Sharon Treat, Institute for Agriculture and Trade Policy
In Support of LD 558, “Resolve, Directing the Department of Agriculture, Conservation
and Forestry To Study Alternative Cropping Systems for Farmers Affected by
Perfluoroalkyl and Polyfluoroalkyl Substances Contamination”
Joint Standing Committee on Agriculture, Conservation and Forestry
March 25, 2021**

Senator Dill, Representative O’Neill and honorable members of the Joint Standing Committee on Agriculture, Conservation and Forestry. My name is Sharon Treat and I live in Hallowell. I am Senior Attorney for the Institute for Agriculture and Trade Policy (IATP), on whose behalf I am testifying today in support of LD 558.

IATP is a 501(c)(3) nonprofit headquartered in Minneapolis, Minnesota with offices in Hallowell, Maine and other locations. IATP works closely with farmers and seeks to promote local, sustainable and environmentally beneficial agriculture and trade policies.¹ We have been following PFAS issues both across the country and in Maine, and attended the meetings of Governor Mills’ PFAS Task Force and submitted detailed comments on the Task Force report.²

Maine farmers have learned the hard way that PFAS threatens their health and livelihoods, and the viability of their farms. Two Maine farms have been forced to shutter their operations because of dairy and beef contamination from these toxic chemicals -- one in Arundel and the other in Fairfield. In Fairfield, in addition to pollution at the farm, at last count over 40 residential drinking water wells in the area are also contaminated, several with off-the-chart levels of PFAS.³

We have to take this contamination seriously, firstly to protect the health of farmers, their neighbors and customers, and secondly, to assure that Maine’s reputation for safe, wholesome, and sustainably grown food remains intact. PFAS exposure has been linked to health problems including kidney and testicular cancer, thyroid disease, infertility and compromised immune systems -- which means PFAS exposure can make people more susceptible to COVID-19 health consequences and may limit the effectiveness of vaccines. Indeed, recent research has found a strong association with PFAS exposure and COVID-19 severity, antibody response, and asthma.⁴

¹ IATP also has offices in Washington, D.C. and Berlin, Germany (IATP Europe). For over 30 years, IATP has provided research, analysis and advocacy on a wide range of agriculture-related issues including farm to school; climate; agroecology; soil health and water quality and access; farmworker health and economic security; and trade and market policies. For more information, see www.iatp.org.

² IATP’s PFAS materials are posted here: <https://www.iatp.org/and-polyfluoroalkyl-substances-pfas>

³ The location and test results for these wells is posted on this interactive DEP website: <https://maine.maps.arcgis.com/apps/webappviewer/index.html?id=2bb04142294948458c81b2ece1011c88>

⁴ In one study, Pentafluorobenzoic acid (PFBA) -- one of several thousand compounds in the PFAS class of chemicals -- detected in plasma showed strong association with the severity of COVID-19. In tissue samples from

Attempts to clean up and remediate PFAS-contaminated farmland have proven to be both ineffective and outrageously expensive. Meanwhile, farmers have lost their livelihoods and had to kill livestock; their water is undrinkable and unsafe; and financial assistance has not yet been forthcoming.

Sadly, it is quite possible that other instances of farm contamination may be discovered in the future as testing of groundwater, soils and dairy products continues. The Maine Department of Environmental Protection (DEP) has uncovered numerous instances of PFAS contamination in groundwater and drinking water wells located near landfills; the levels of PFAS contamination near some landfills are similar to or exceed levels found at Superfund sites in Maine.⁵ The DEP has identified some 500 properties where sludge was spread over the past 40 years, but testing at most of those sites remains to be done. Fish caught in both rivers and lakes, from northern Maine to the Kennebec River, have been found to be contaminated with PFAS.⁶

Even if we took immediate action to stop selling products containing PFAS and tomorrow stopped all land spreading of sludge, this persistent and mobile “forever chemical” will continue to leach out of landfills and from soils and travel long distances in ground water. The situation in Fairfield vividly illustrates this problem; it is possible that contamination was caused by sludge that was spread in the area at least 17 years ago.⁷

This Resolve, and the study it would initiate, would be an important first step in understanding how farm produce and livestock is affected by PFAS, and identifying potential help – both technical and financial -- for farmers who are or may be affected. Other states are engaged in

autopsies, PFBA accumulated in the lungs. COVID-19 affects the functioning of the lungs, and the positive association of PFBA concentration and COVID-19 severity suggests that PFBA could be heightening the damage to the lungs from COVID-19. Research is also suggestive that PFAS exposure reduces the antibody response for certain illnesses, raising concerns that PFAS may negatively affect the efficacy of the COVID-19 vaccines. For sources and additional information, see the attached Appendix on COVID-19 and PFAS.

⁵ Final Report from the Maine PFAS Task Force, Appendix C, PFAS Results Summary (January 2020). For example, In DEP’s tests of drinking water wells near landfills (116 samples), the agency found maximum levels of 458 ng/l for PFOA, 120 ng/l for PFOS and 470 ng/l for combined PFOA + PFOS. Average results were also high; 46.0 ng/l for PFOA, 13.5 ng/l for PFOS and 52.5 ng/l for combined PFOA + PFOS. To put these data in perspective, New Hampshire has finalized drinking water standards intended to protect the most sensitive populations over a lifetime of exposure. The New Hampshire Maximum Contaminant Levels (MCLs) are: PFOA, 12 ppt; PFOS, 15 ppt; PFHxS, 18 ppt; and PFNA, 11 ppt. See, New Hampshire Department of Environmental Services, NHDES Proposes New PFAS Drinking Water Standards, Final Rulemaking Proposal for PFOA, PFOS, PFHxS and PFNA, June 28, 2019, <https://www.des.nh.gov/media/pr/2019/20190628-pfas-standards.htm> DEP’s tests of groundwater near landfills showed even higher levels of PFAS contaminants. Groundwater results topped out at 3,050 ng/l for PFOA, 2700 ng/l for PFOS and 3095.1 ng/l for combined PFOA + PFOS. Even the average groundwater sample, out of about 46 samples for this category, found levels of 407.3 ng/l for PFOA, 204.1 ng/l for PFOS and 587 ng/l for combined PFOA + PFOS.

⁶ Barry Mower, “PFAS in Maine water, sediment, and fish,” Presented to Governor Mills’ PFAS Task Force (September 25, 2019), <https://www.maine.gov/pfastaskforce/materials/20190925/BMower-presentation-PFAS-in-Maine.pdf>

⁷ Briefing on PFAS Task Force to the Environmental and Natural Resources Committee by David Burns, Director of DEP’s Bureau of Remediation and Waste Management, February 8, 2021

PFAS research through their universities and the Cooperative Extension, and it would be great to get the University of Maine working hand in hand with DACF on this. For example, the Colorado College of Mines is working with that state's agriculture department and Department of Public Health and Environment to research how irrigation water contaminated with PFAS could taint produce.⁸ Connecticut's PFAS Action Plan recommended that the scope of the work by the Connecticut Agricultural Experiment Station be expanded to include PFAS detection in soils and foods.⁹ The University of North Dakota has been able to secure federal funding from EPA (\$500,000) to research PFAS and develop practical strategies for removing PFAS from groundwater.¹⁰

To date, Maine and other states have mostly had to rely on their own resources. The Maine Center for Disease Control and Prevention (CDC) is already carrying out important and pathbreaking work to understand agronomic uptake of PFAS and the link to milk. DACF Commissioner Amanda Beal is leading a PFAS committee through the National Association of State Departments of Agriculture that could be helpful in advocating for federal funding and action, and also facilitating information-sharing among the states. Ideally, tackling PFAS contamination and the impacts on food, farmers and agriculture should be an effort led and funded by the federal government. Perhaps, with a new federal administration and an Environmental Protection Agency head, Michael Regan, who dealt with PFAS in his former position in North Carolina, more help may be on the way.

We can't take a wait-and-see approach, however. Most of the federal action so far has not been directed to agricultural impacts and solutions. The USDA has been slow to get involved, although it has significant financial resources that could be brought to bear. This Resolve could help Maine move ahead with our own research, while identifying best practices to help impacted farmers and making the case for funding and federal assistance.

Thank you for your consideration. We urge an "ought to pass" recommendation on this important legislation. Respectfully submitted,

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⁸ Agricultural water contaminated with "forever chemicals" could taint produce, Colorado study finds, <https://coloradosun.com/2020/11/23/forever-chemicals-food-colorado-school-of-mines/>

⁹ PFAS Action Plan November 2019, Appendix to the PFAS Action Plan, and Response to Comments on the Draft Action Plan, <https://portal.ct.gov/DEEP/Remediation--Site-Clean-Up/PFAS-Task-Force/PFAS-Task-Force>

¹⁰ <https://www.epa.gov/newsreleases/epa-awards-500k-university-north-dakota-advance-innovation-and-research-pfas>

Attachment: Summary of scientific information on PFAS and COVID-19 severity and antibody response¹¹

Exposure to PFAS. COVID-19 has affected the United States tremendously, with 24.5 million total cases and as of February 8, 2021, at least 462,037 deaths. Scientists have been assiduously researching the behavior of the virus and what affects the severity of it. Severe illness from COVID-19 is often attributed to co-morbidities and old age, but the fact that environmental exposure to chemicals can affect the severity of the virus has been largely overlooked.

Per- and polyfluoroalkyl (PFAS) substances are a chemical group that have a strong carbon-fluorine bond that makes these substances extremely resistant to thermal, chemical, and biological degradation, which results in the bioaccumulation up the food chain and its persistence in human tissues for many years (Browne et al., 2020). PFAS is often used in surfactants, water repellent sprays, adhesives, paintings, and lubricants and are found in many consumer products including clothing, food packaging and cookware, as well as firefighting foams and industrial uses. Humans are exposed to PFAS through food and water contamination (Quinete and Hauster-Davis, 2020) and other sources including household dust. PFAS compounds are now detectable in the blood of virtually all Americans (98%) according to the U.S. Centers for Disease Control and Prevention (U.S. CDC), and because of its long biological half-lives in humans, it could stay in the body for 3.8 to 7.3 years (Browne et al., 2020), potentially causing a multitude of health problems.

PFAS' association with COVID-19. Research has found a strong association with PFAS and COVID-19 severity, antibody response, and asthma. In one study, Pentafluorobenzoic acid (PFBA) -- one of several thousand compounds in the PFAS class of chemicals -- detected in plasma showed the strongest association with the severity of COVID-19. The health consequences of PFBA are often overlooked due to its short elimination half-life in the blood compared to the other compounds, but in tissue samples from autopsies, PFBA is the only PFAS that is substantially accumulated in the lungs (Grandjean et al., 2020). COVID-19 affects the functioning of the lungs, where in severe cases, the lungs will inflame making it hard to breathe and potentially causing pneumonia. The positive association with PFBA concentration and COVID-19 severity suggests that PFBA could be heightening the damage to the lungs.

What makes the COVID-19 virus fatal is its potential to induce a cytokine storm, where the infection triggers the immune system to overload the bloodstream with cytokines, which are inflammatory proteins, resulting in tissue and organ damage. A cytokine storm results in fatal outcomes due to complications with lung inflammation, pneumonia, and respiratory issues. Perfluorooctane Sulfonate (PFOS), a PFAS compound, was found to alter cytokine production due to inconsistent production of specific cytokines (Bodin et al., 2016 and Zheng et al., 2011).

¹¹ Researched and written by Loren Yu, Colby College '23

PFAS affects the behavior of cytokines in the body, which could induce a cytokine storm while battling COVID-19, leading to a more severe case.

PFAS' effect on asthma. PFAS could also indirectly affect the severity of COVID-19 by worsening other physical ailments, such as asthma. PFAS compounds, Perfluorooctanoic acid (PFOA) and Perfluorooctane Sulfonate (PFOS), were associated with greater odds of asthma diagnosis in children age 3-5 and were positively associated with asthma severity scores among already asthmatic children aged 9-16 years (Dong et al., 2013). A biological explanation is based on limited evidence that suggests early-life exposure to these compounds could induce immune dysfunction. According to the U.S. CDC, people with moderate to severe asthma may be at higher risk from getting a severe case of COVID. Asthmatics with COVID-19 may find it extremely difficult to breathe, and they already have a higher risk of developing pneumonia due to previous lung damage.

PFAS' effect on antibody response. There has also been research into the effect of PFAS on antibodies. It was found that elevated PFAS exposure is associated with lower antibody responses to vaccinations in children and adults. The doubling of prenatal PFAS concentration was associated with a substantial decrease in antibody concentrations of diphtheria, a bacterial infection (Grandjean et al., 2012). Another study found a negative relationship between PFAS concentrations at delivery and children's anti-rubella antibody at three years of age (Granum et al., 2013). Such evidence suggests that PFAS reduces the antibody response for certain illnesses, raising the concern that PFAS may negatively affect the efficacy of the COVID-19 vaccines.

Conclusion. Most people are aware of the link between the severity of COVID-19 and pre-existing health conditions. However, evidence suggests that PFAS, a family of chemicals we are exposed to regularly, deteriorates immune functioning, including response to COVID-19. It is essential to focus on an individual's health when battling COVID-19, but it is also important to be mindful of the environmental contaminants we are perpetually exposed to, as we develop research and policy responses to the pandemic.

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