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**SB 158: Pesticide Regulation - PFAS Testing - Requirements Bill**

Submitted to: Senate Education, Energy and Environment Committee

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**Position: Supporting**

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Hello, I am Dr. Steven Lasee. I have a masters and doctoral degree in Environmental Toxicology from Texas Tech University. **The primary focus of my research for nearly 10 years has been per and poly-fluoroalkyl substances (PFAS) exposure, particularly through consumption of food and drink.** Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) are the two most well-known members of this chemical group and the two of highest regulatory concern. PFAS and PFOS are two very similar terms that can get confusing. PFAS is the chemical group, and PFOS is a chemical that is part of that group.

In summary, these are the major points from this testimony:

- 98% of Americans' PFAS exposure is through their mouths. Exposure to PFAS is associated with numerous serious health effects.
- As noted in my peer-reviewed research, I observed PFAS in 6 out of 10 common insecticides we tested.
- PFAS were also observed in corn, green beans, peanuts, and soil collected from the test site.
- PFOS concentration in the corn, green beans, and peanuts were thousands of times higher (323 ppt, 426 ppt, and 41 ppt) than the EPA's interim health advisory level for PFOS in drinking water (0.02 ppt).
- PFAS concentrations found in soils treated with the tested insecticides will result in concerning PFAS concentrations in the food grown in it for many years to come.
- Additional PFAS, other than PFOS, found in plant and soil samples at the site suggest additional unknown sources of PFAS impacting the site (ie. other applied products, degradation of other PFAS, environmental transport from elsewhere).

I'm giving testimony because I am an expert in PFAS exposure and, primarily, because **I recently published a peer-reviewed study where I found PFAS concentrations (PFOS in particular) in 6 out of 10 tested insecticides** (*Lasee et al. 2022* [1]). I observed PFOS concentrations ranging from 3.9 – 19.2 million parts per trillion (ppt) in the insecticide samples I tested**. The PFOS I observed was not a listed component of the products.** Possible explanations for this PFOS could be: proprietary "inert" ingredients not required in labeling by the EPA, contamination during manufacturing, or post manufacturing contamination (ie. containers, application equipment). Regardless of how the PFOS got into the insecticides, it will end up on anything they are applied to, including our food.

**EPA scientists have estimated that 98% of the average American's exposure to PFAS happens through their mouth** (oral consumption of food, water, and, to a much lesser extent, dust containing PFAS *(Egeghy and Lorber 2011* [2]*; Lorber and Egeghy 2011* [3])). Many PFAS have incredibly long biological half-lives in humans (some as high as 10+ years) making any exposure to these chemicals a lifelong ordeal. PFAS blood concentrations are associated with reduced birth weight and head size, weakened immune system, endocrine disruption, weight gain, and certain types of cancer.

As I stated earlier, the majority of exposure to PFAS occurs through food and water consumption. In my study, **I tested crops grown at the site (a USDA crop genetics research center) to see if the PFOS concentrations I found in the insecticides were reflected in the crops**. PFOS was not the only PFAS I found. Corn, green beans, and peanut samples collected from the site had PFOS concentrations of 323 ppt, 426 ppt, and 41 ppt. The EPA is currently in the process of developing new exposure guidelines for PFOS, but their interim health advisory level for PFOS in drinking water is 0.02 parts per trillion (ppt). When I went searching for control (non-contaminated) crops near the site, all fields I sampled within two miles were similarly contaminated with PFAS, suggesting the PFAS contamination I observed could be more pervasive and impact numerous different crops meant for both human and animal consumption.

These numbers aren't directly translatable, but a single serving (100 grams, about a cup) of the vegetables I tested would result in a PFOS exposure equivalent to consuming 1,100 (corn), 1,400 (beans), and 140 (peanuts) years of PFOS-contaminated water at the EPA's interim health advisory level. I know that sounds ridiculous, 1400 years of exposure from a cup of beans? **But the interim health advisory level set up by the EPA was done under the idea that no exposure to PFOS (and PFOA) is really "safe" over a lifetime.**

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[1] Lasee S, McDermett K, Kumar N, Guelfo J, Payton P, Yang Z, et al. 2022. Targeted analysis and Total Oxidizable Precursor assay of several insecticides for PFAS. J Hazard Mater Lett 3:100067

[2] Egeghy PP, Lorber M. 2011. An assessment of the exposure of Americans to perfluorooctane sulfonate: A comparison of estimated intake with values inferred from NHANES data. J Expo Sci Environ Epidemiol 21:150–168

[3] Lorber M, Egeghy PP. 2011. Simple intake and pharmacokinetic modeling to characterize exposure of Americans to perfluoroctanoic acid, PFOA. Environ Sci Technol 45:8006–8014

**PFAS are notoriously resistant to degradation. Most PFAS of toxicological concern essentially do not break down in the environment, and, those that do break down, tend to break down into other PFAS. PFAS that make their way into soils tend to stay there and are available for uptake by plants**. I tested the soil at the site and found concentrations of several PFAS. PFOS was the highest at 1720 ppt, which is not surprising considering the source could be the insecticides I tested. This soil PFOS could contribute 397 ppt PFOS to the shoot and 387 ppt to the root tissues of plants grow in the soil (Using equations developed from *Lasee et al. 2020* [4]). **This PFAS in the soil will continue to pose consumptive risk through plant uptake essentially indefinitely.**

Reduction of sources of PFAS in our food system through SB 158's protection from PFAS in pesticides will ultimately reduce human exposure to PFAS. Therefore, I urge a favorable report from this committee on SB 158. Thank you for your time. Please contact me if you have any questions.

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[4] Lasee S, Subbiah S, Deb S, Karnjanapiboonwong A, Payton P, Anderson TA. 2020. The Effects of Soil Organic Carbon Content on Plant Uptake of Soil Perfluoro Alkyl Acids (PFAAs) and the Potential Regulatory Implications. Environ Toxicol Chem 00:1–14