HB 737 Informational Presentation: PFAS, Food Products & Biosolids

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Primary Routes of Exposure & Relevant Environmental Media

Ingestion

Relevant Media

- Groundwater
- Surface Water
- Soil (Incidental ingestion)
- Biota & Food

Primary Route of Exposure for PFAS Dermal (Skin)

Contact

Relevant Media

- Groundwater
- Surface Water
- Soils

Less Significant Route of Exposure for PFAS at Certain Concentrations

Inhalation

Relevant Media

- Ambient Air
- Soil/Dusts
- Vapors

Least Characterized Route of Exposure for PFAS, and Poorly Understood

Potential Sources of Per- & Polyfluoroalkyl Substances for Dietary Exposure

"Environmental' Contributions

- Water, Soil, Sediment
- Organism's Food web
- Environmental Releases of PFAS

"Food Processing & Packaging" Contributions

Industrial Food processing

Dietary PFAS Exposure

PFAS in Packaging

"In-Home" Contributions

- Cookware
- PFAS in Water
- Other sources



In-Home Food Preparation

- Use of cooking equipment treated with PFAS for non-stick properties, potential degradation of Teflon and replated fluoropolymers.
- Potential sorption of PFAS to certain foods from contaminated water (*very poorly studied and quantified*).
- Indoor sources of PFAS including cleaning products, household dusts and residues from various consumer products.

EPA's PFOA Stewardship Program

- Aimed to reduce production and usage of PFOA and certain precursors through 8 major companies.
- Limited international application, meaning international products may contain PFOA or precursors.

Drinking Water Maximum Contaminant Level (MCL) and Ambient Groundwater Quality Standards (AGQS)

- PFOA (12 ng/L), PFOS (15 ng/L), PFHxS (18 ng/L) & PFNA (11 ng/L). NHDES conservatively applies these to water for *consumptive purposes*.
- EPA issued final Health Advisories for GenX (10 ng/L) and PFBS (2,000 ng/L), as well as <u>Interim</u> Health Advisories for PFOA (0.004 ng/L) and PFOS (0.020 ng/L). Both are applied only to drinking water, and not food items.

Other In-Home Sources

- Some brands of cookware contain "PFOA Free" labeling.
- Various entities have loose/limited guidance for avoiding PFAS in consumer products (e.g., <u>EWG</u>).
- Several studies have demonstrated that PFAS are present in a myriad of other indoor sources (e.g., <u>ATSDR</u>).

Outside of drinking water (NHDES/EPA), consumer products present a unique challenge for reducing PFAS exposure (FDA and EPA).





Commercial Processing & Packaging

- No uniform definition(s) of PFAS.
- Still approved for food packaging. Think about carryout containers, deli packaging, and other grocery store paper goods.
- Industrial food processing is messy, and contamination occurs.
- Alternatives may present "*regrettable substitutions*" if packaging bans are not thought through.

U.S. Food Drug Administration (FDA)

- FDA has various ongoing actions and evaluation related to PFAS (FDA $\underline{\&}$ PFAS)
- Per FDA (2022), PFAS that are authorized for use in contact with food generally fall into four application categories:
 - Non-stick cookware: PFAS may be used as a coating to make cookware non-stick.
 - Gaskets, O-Rings, and other parts used in food processing equipment: PFAS may be used as a resin in forming certain parts used in food processing equipment that require chemical and physical durability.
 - **Processing aids**: PFAS may be used as processing aids for manufacturing other food contact polymers to reduce build-up on manufacturing equipment.
 - **Paper/paperboard food packaging**: PFAS may be used as greaseproofing agents in fast-food wrappers, microwave popcorn bags, take-out paperboard containers, and pet food bags to prevent oil and grease from foods from leaking through the packaging.

New Hampshire, Bottled Water and Food Processing Regulation

- Current regulation require bottled water to meet the NHDES MCLs for PFAS per the <u>NH Division of Public Health Services</u>, Food Protection <u>Program</u>.
- Rules and regulations generally reflect national requirements due to complex interstate considerations.

Food processing safety is under the purview of FDA (federal) and NH DPHS Food Safety Program (state).



Food Production & Agriculture

- PFAS are found in certain agriculture products around the country.
- Plants ≠ Animals. Bioaccumulation is species-dependent, regarding both <u>organism species</u> and <u>PFAS</u> <u>species</u>.
- Analytical capability and capacity is limited across most foods, especially at the state level.
- Requires engagement with NH Department of Agriculture, Markets & Food



NHDES Activities Related to Agriculture

- Evaluating potential sources of PFAS to land used for agriculture.
 - Includes: historic uses, biosolids, pesticide application and nearby sources
 - Biosolids have considerable attention due to news about farms in Maine.
- Currently studying PFAS uptake into select garden plants to assess available risk models for home gardeners (a partnership with NHTI Community College).

Anthony Drouin will discuss biosolids and PFAS testing results in the second half of this presentation.

Conceptual Model of PFAS Uptake into Plants (from ITRC, 2022; Fig 17-2)

- Uptake varies by PFAS
- Dissimilar to animal trends
- Very few studies available to evaluate modifying factors (e.g., soil type, pH, species/strain)



Wildlife & Game

- Purview of NH Fish and Game, with Technical support from NHDES.
- Again, species difference mean plants ≠ animals.
- Issuing advisories is limited by availability of tissue data, and there is no "state lab" for analyzing PFAS in wildlife.

Existing Fish and Game Advisories in NH

- Fish Tissue Advisories (NH Fish Advisories for Chemicals)
 - Fish preferentially bioaccumulate certain long-chain PFAS faster than other organisms.
- Deer near the Great Bay Wildlife Refuge (<u>NH Fish & Game Findings</u>)
 - Non-detect in muscle, some detections in liver tissues.
 - NH discourages any consumption of deer or moose liver due to cadmium.
- Ongoing studies with academic institutions: freshwater finfish, marine finfish, and coastal shellfish.
 - Overview of ongoing studies is available here: <u>YouTube</u> <u>Presentation (1 hour, 23 minutes)</u>

NHDES Report on Development of Surface Water Criteria

- Report has been available on the NHDES website since 2019: <u>Plan</u> to generate PFAS Surface Water Quality Standards.
- Include the protection of wildlife (ecological risks), and the protection of wildlife for the purpose of human consumption (human health risks).

As data becomes available, NHDES, NH Fish & Game and EPA work together to identify risks and issue consumption advisories.



Questions?

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