The Automated Extraction of 40 PFAS Compounds From Tissue Samples

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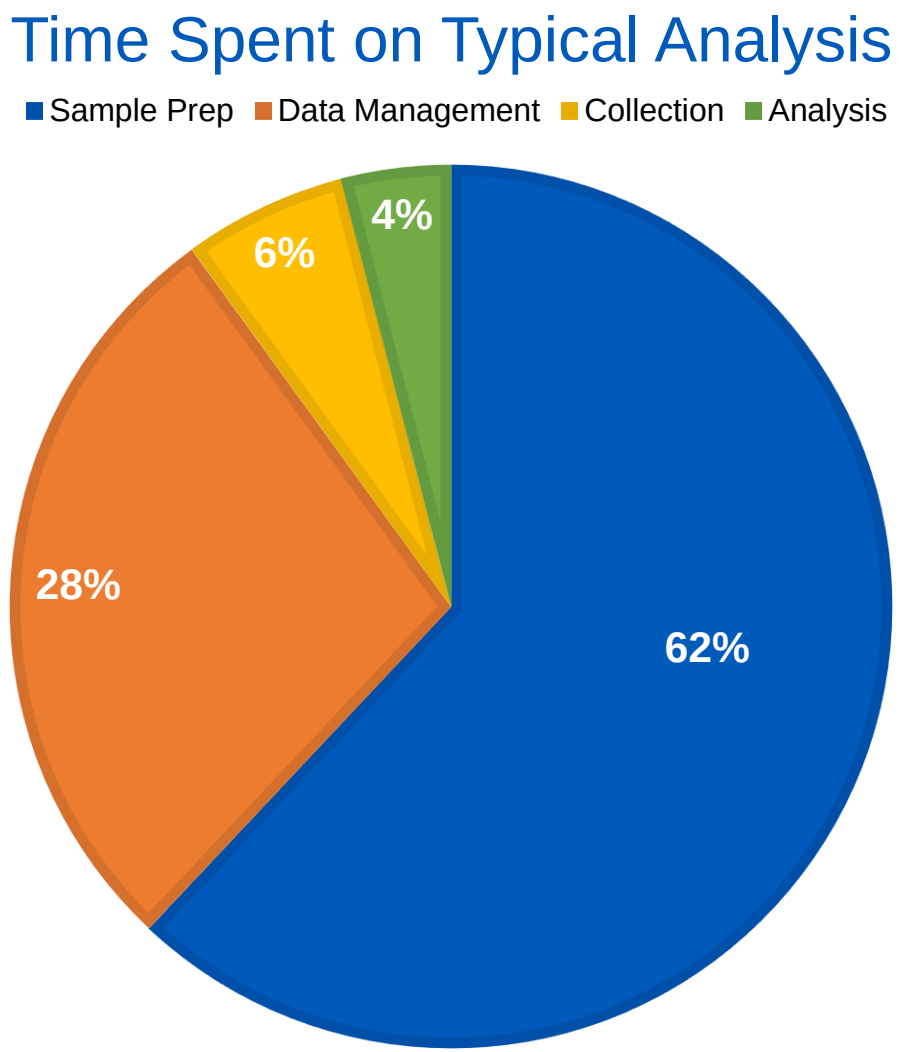
Sample Preparation is the Bottleneck



R.E. Majors, LC/GC Magazine

Need for rapid, efficient, and safe sample preparation!

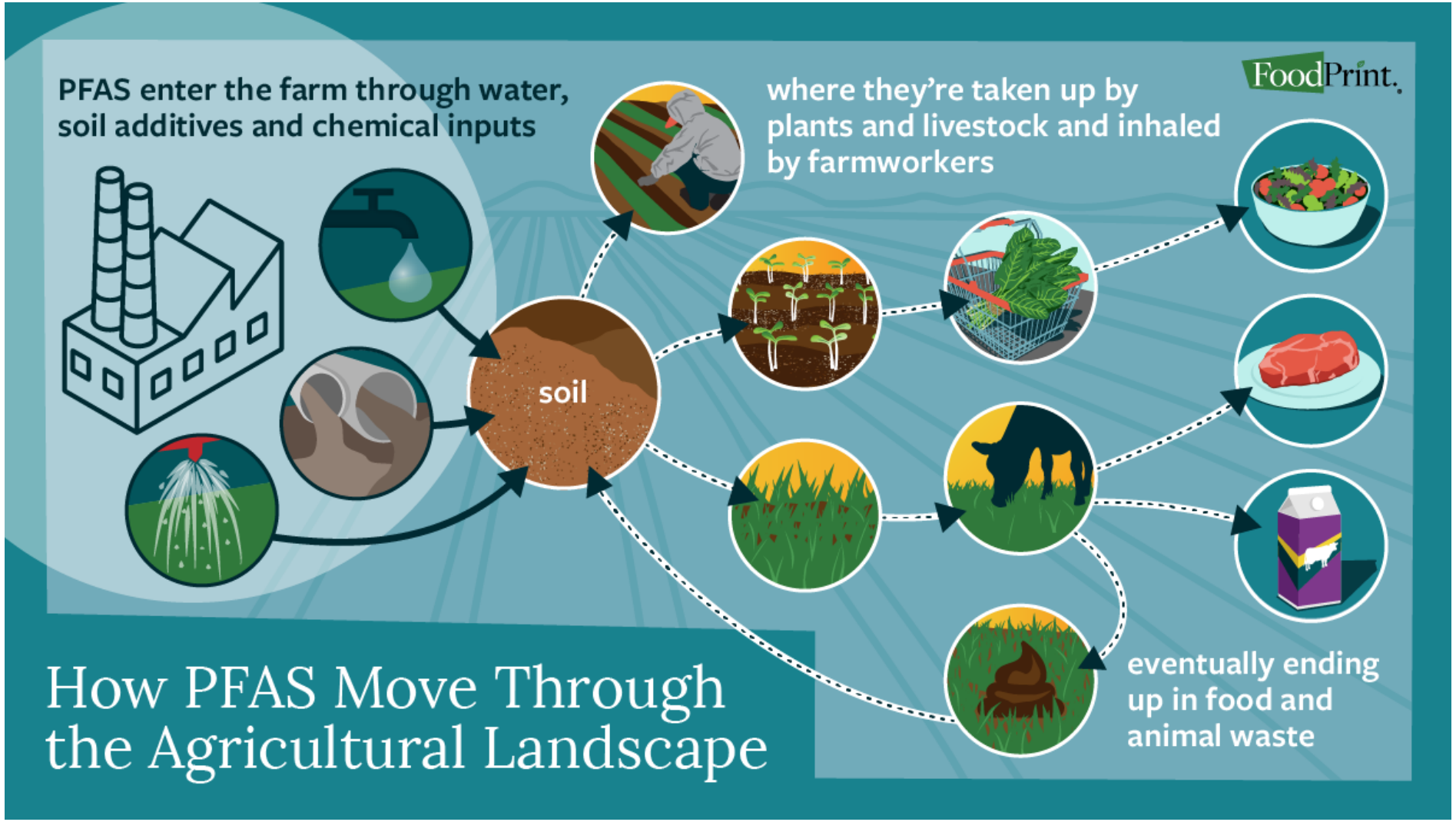
EDGE PFAS: Automated Solvent Extraction

- Pressurized Fluid Extraction
- Sequential – automates 12 samples per rack
- Filtration step included
- Reusable Q-Cup sample cell

EDGE Advantages

- Automation
- Improved repeatability
- Simple
- Applicable to many matrix types
- Safe

PFAS Cycle



https://foodprint.org

PFAS in the News

PFAS in Food, Clothes, and Home

https://www.nrdc.org/stories/forever-chemicals-called-pfas-show-your-food-clothes-and-home

3M to Discontinue Use of PFAS by 2025

https://pfas.3m.com/pfas_uses

US Drinking Water Limits

National Primary Drinking Water Regulation (NPDWR) for six PFAS

Compound	Final MCL (ppt)
PFOA	4
PFOS	4
PFHxS	10
PFNA	10
HFPO-DA	10
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless) Hazard Index

- 3 years to complete initial monitoring
- 5 years to implement solutions
- 5 years must provide notice of violation

https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas

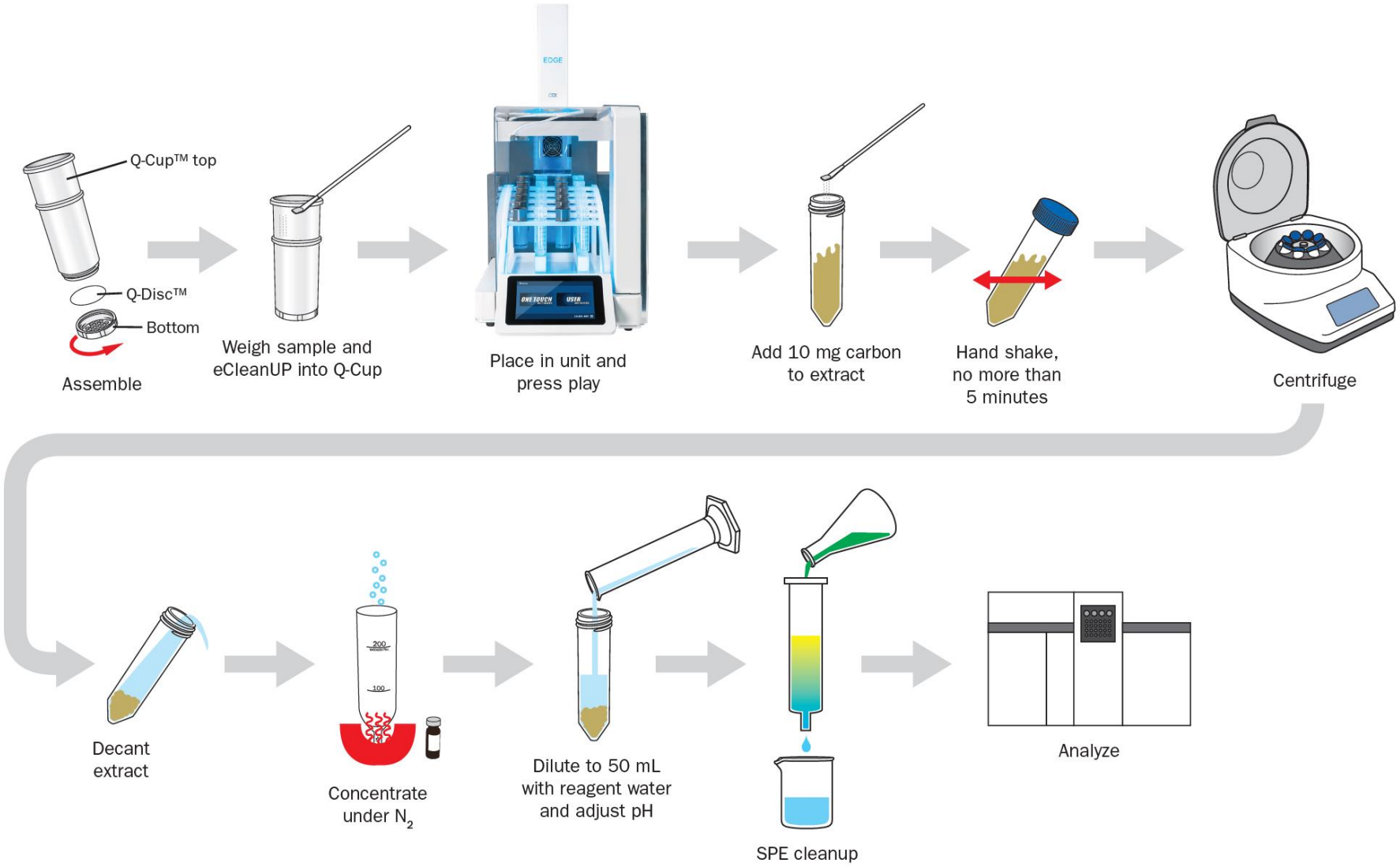
PFAS: Worldwide Concern

Initial focus was water

Focus expanding to include environmental solid samples

EPA 1633

EDGE PFAS Extraction and Clean Up



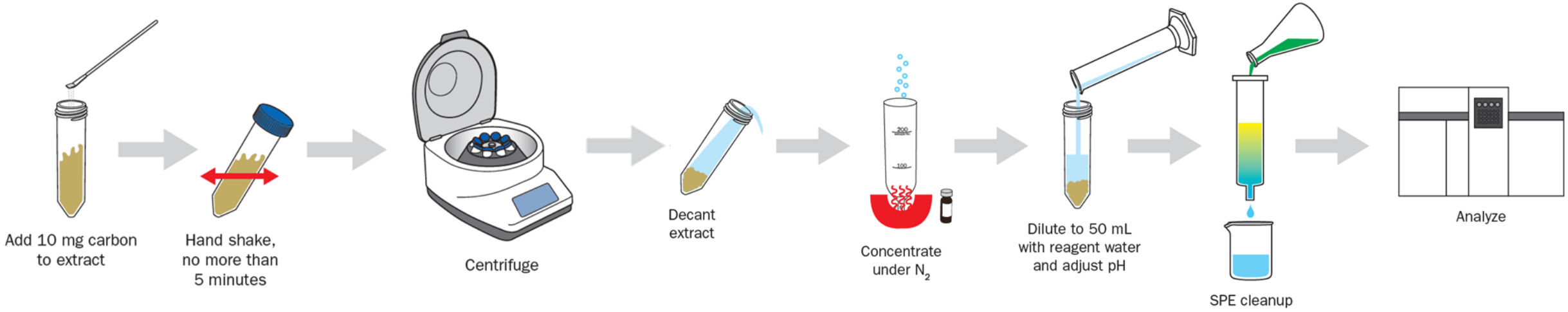
EDGE PFAS Sample Preparation

Layered in Q-Cup
Spike: As described in EPA 1633
Sample: 2 g tissue
Q-Disc PFAS (filter)

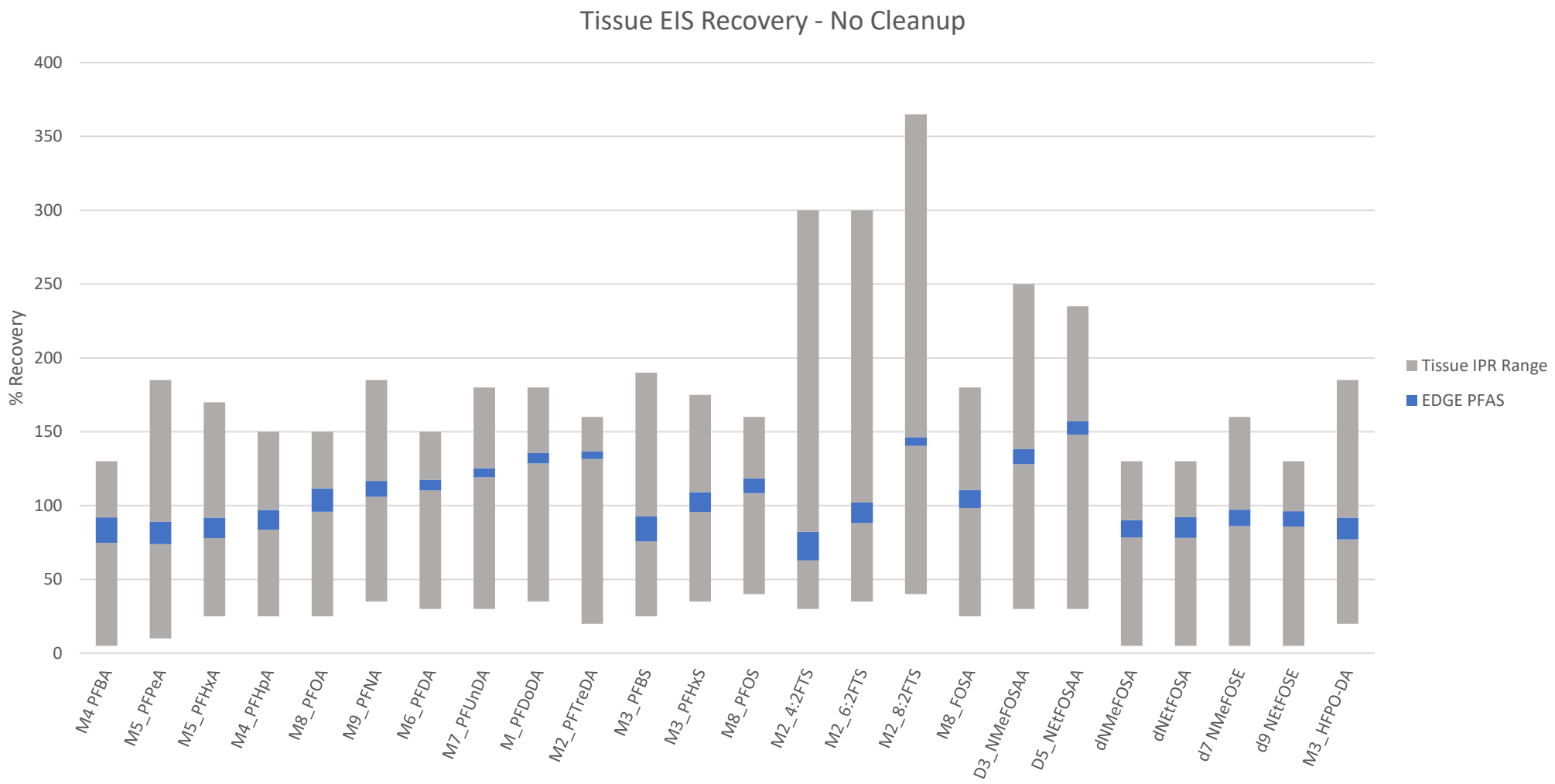
EDGE PFAS Tissue Method

Cycle	Solvent	Top Add (mL)	Temp (°C)	Hold Time	Rinse (mL)
1	0.05 M KOH in MeOH	15	65	3:00	--
2	0.05 M KOH in MeOH	10	65	3:00	5
3	0.05 M KOH in MeOH	5	--	--:--	5
Wash 1	MeOH	15	65	0:15	N/A
Wash 2	0.05 M KOH in MeOH	15	--	--:--	N/A

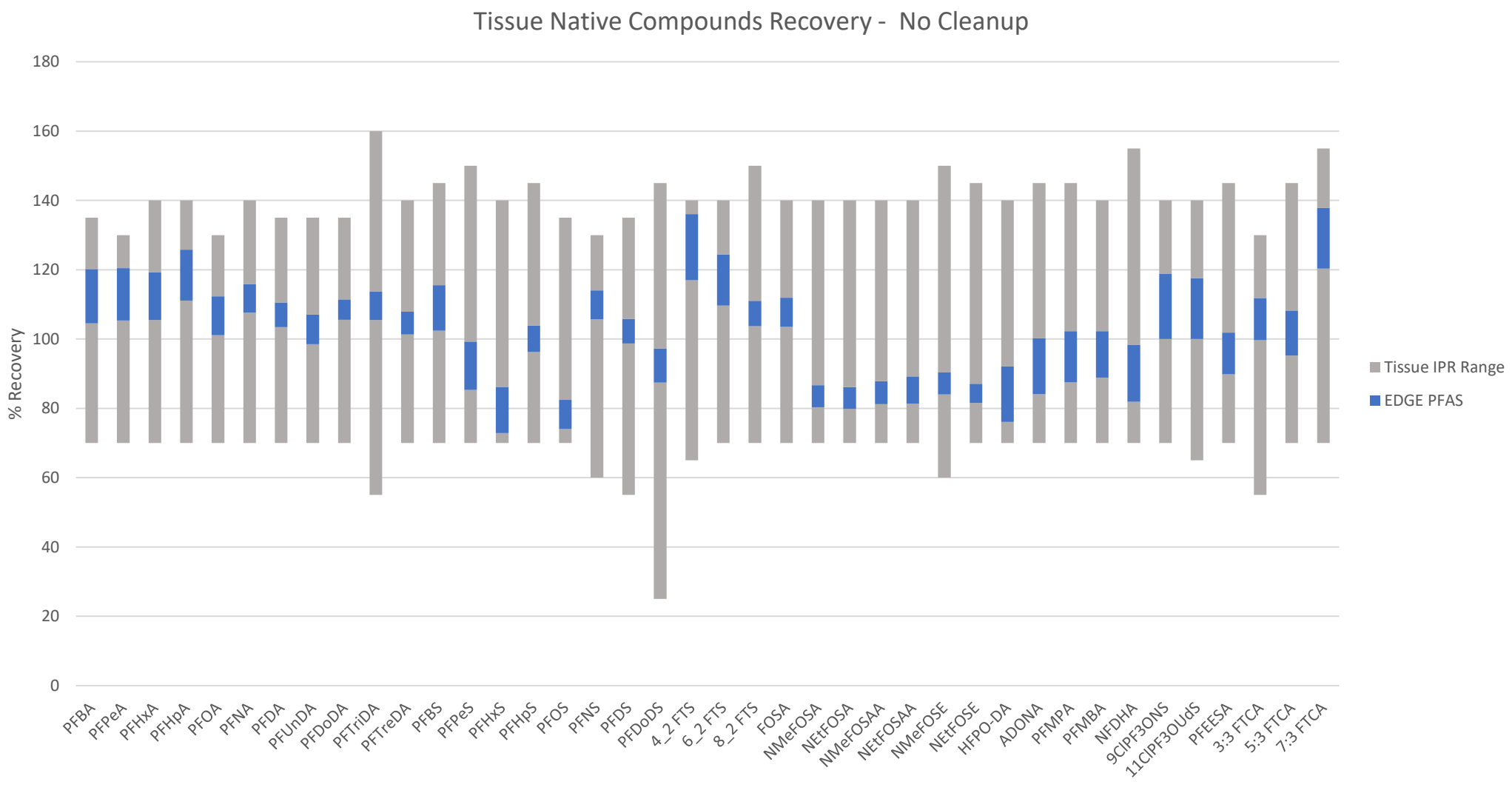
Clean Up and Analysis



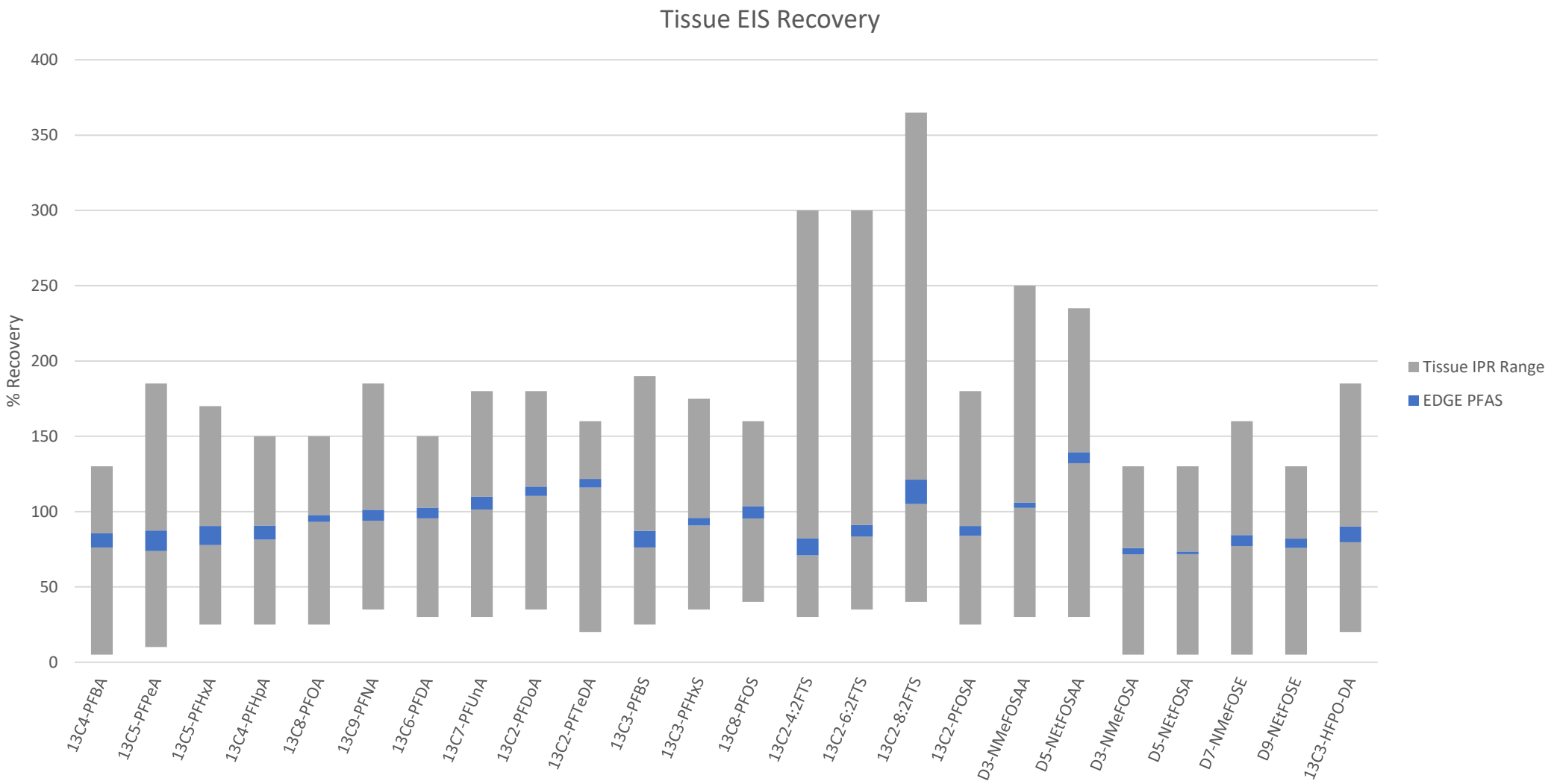
Chicken Data: No Cleanup



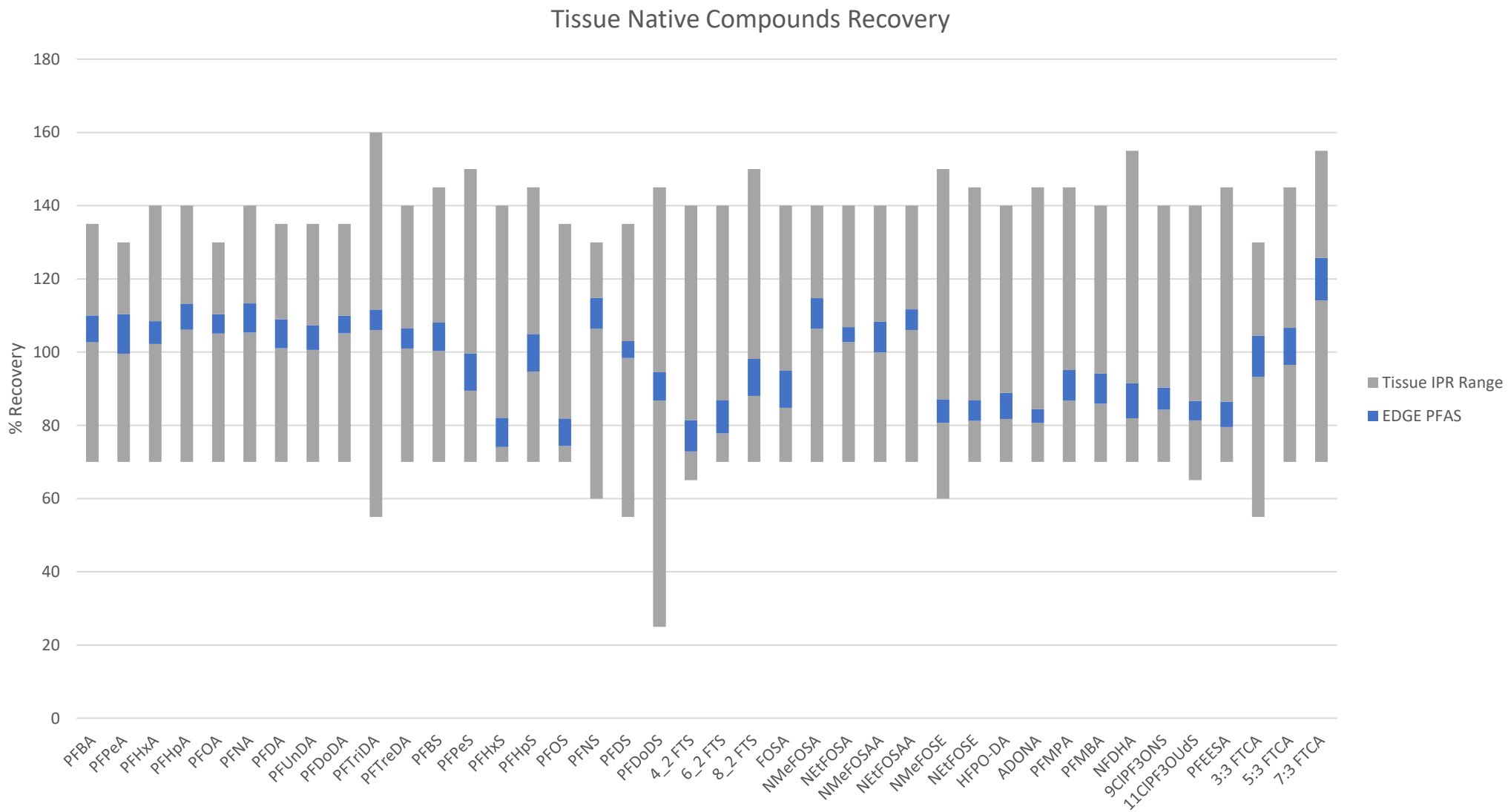
Chicken Data: No Cleanup



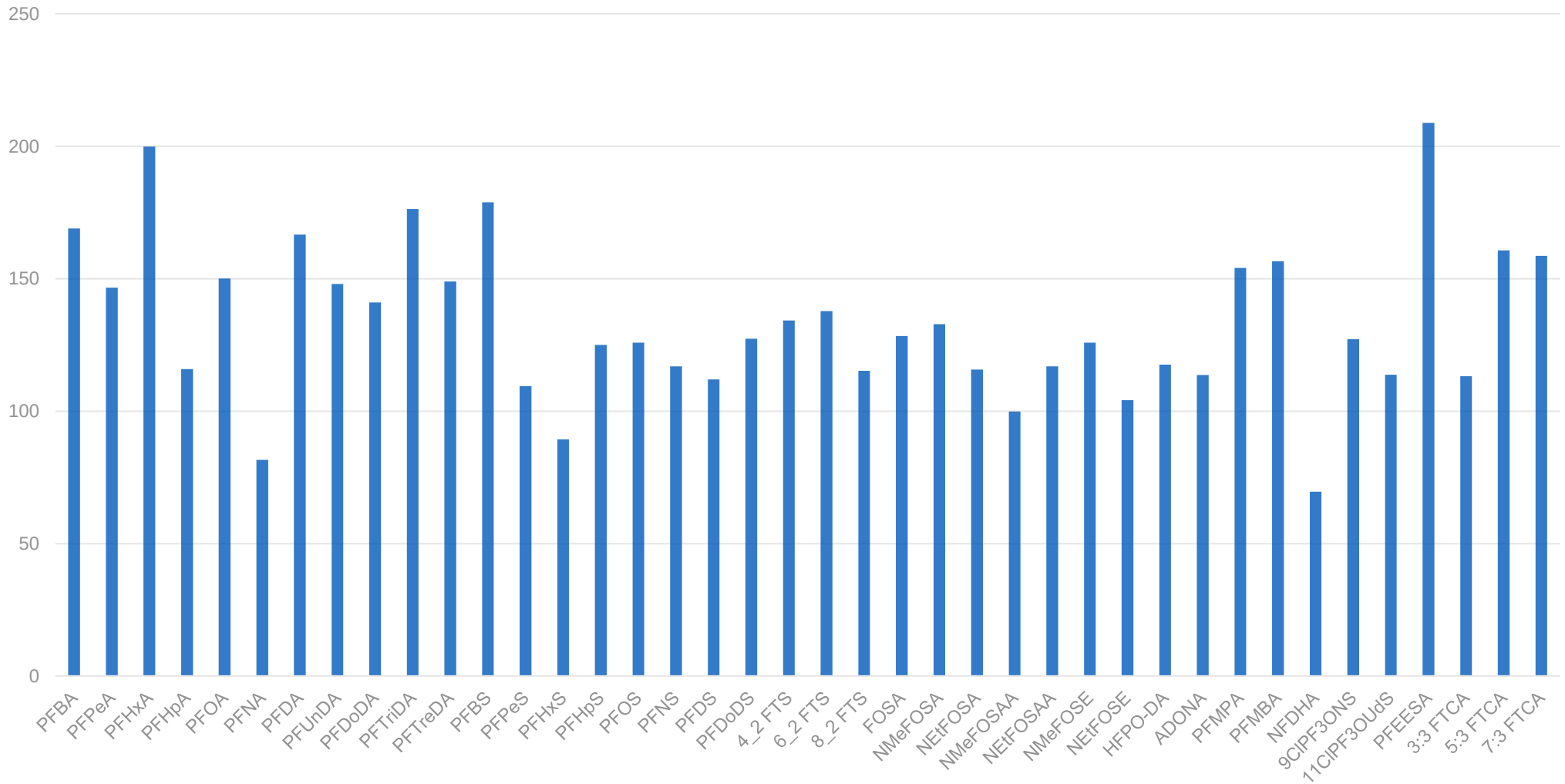
Chicken Data: EPA 1633 Cleanup



Chicken Data: EPA 1633 Cleanup



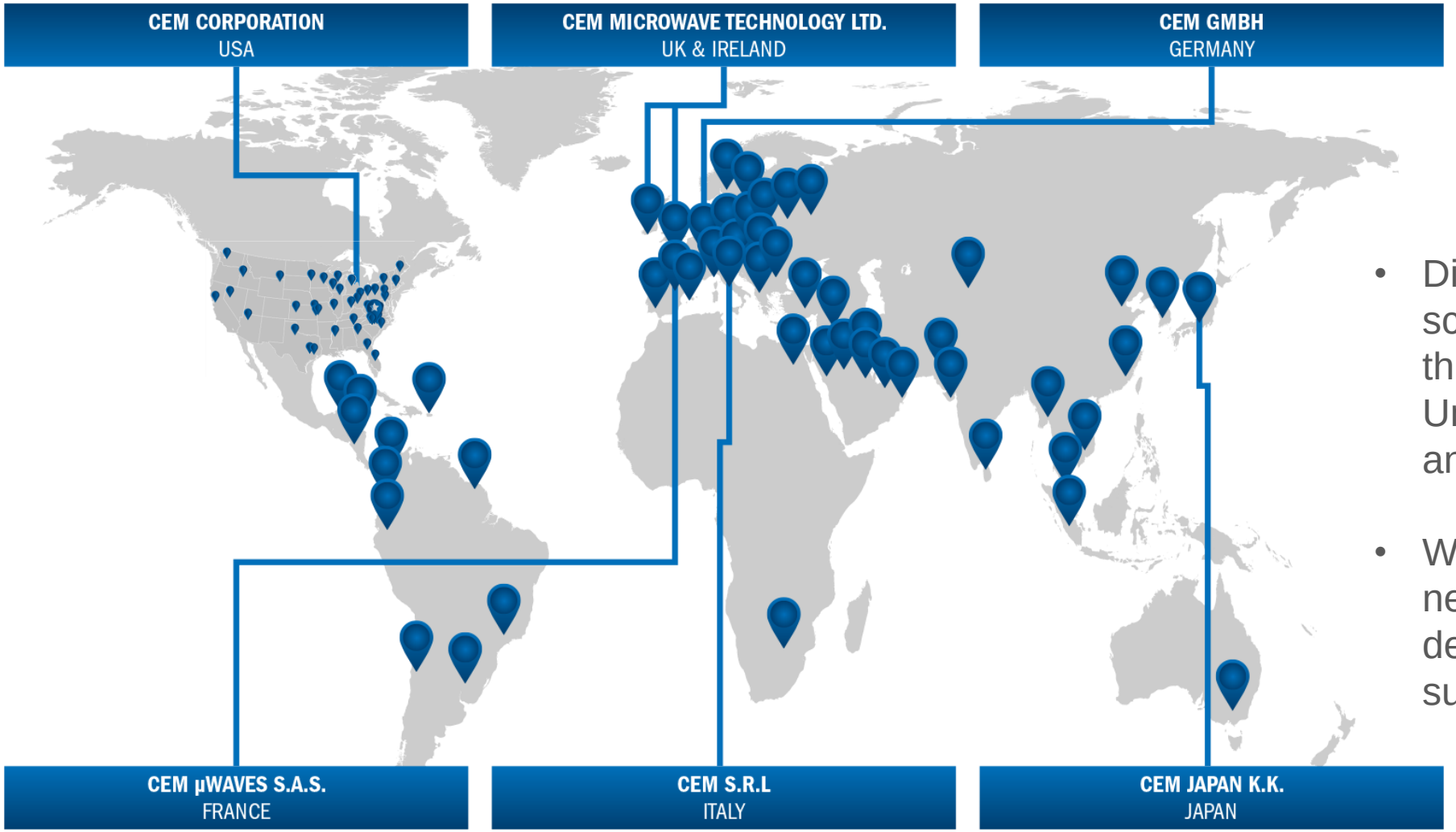
Preliminary Tilapia Data



Summary

- Good recoveries and RSD values for tissue samples
- No contamination from systems or consumables
- Automated and efficient extraction of PFAS from solid samples

We Are Where You Are



- Direct employees scattered throughout the United States and Canada
- Worldwide network of dealers and subsidiaries

Acknowledgments

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Applications Scientist

Kari Organtini with Waters Corporation for doing the analysis.

Come see CEM in Booth 32

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Questions

Ruth Marfil-Vega will be presenting today at 3:30pm in the PFAS in the Environment section covering additional work, as part of our collaboration with Shimadzu.