

Is More More or Less?

INFORMATION VALUE IN PFAS ANALYSIS

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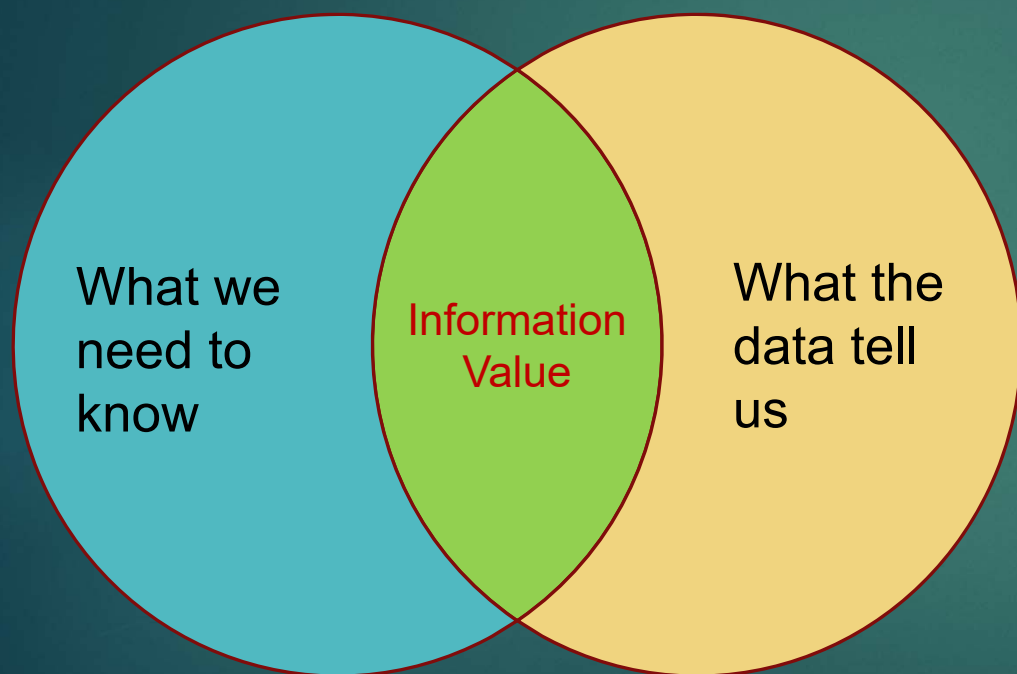
An illustrative tale

- ▶ Hansel and Gretel knew the house was made of gingerbread and candy.
- ▶ What they didn't know was that the seemingly nice old lady was not at all nice.
- ▶ The value of their information was low because it was insufficient and inaccurate.



Information Value of Environmental Analytical Data

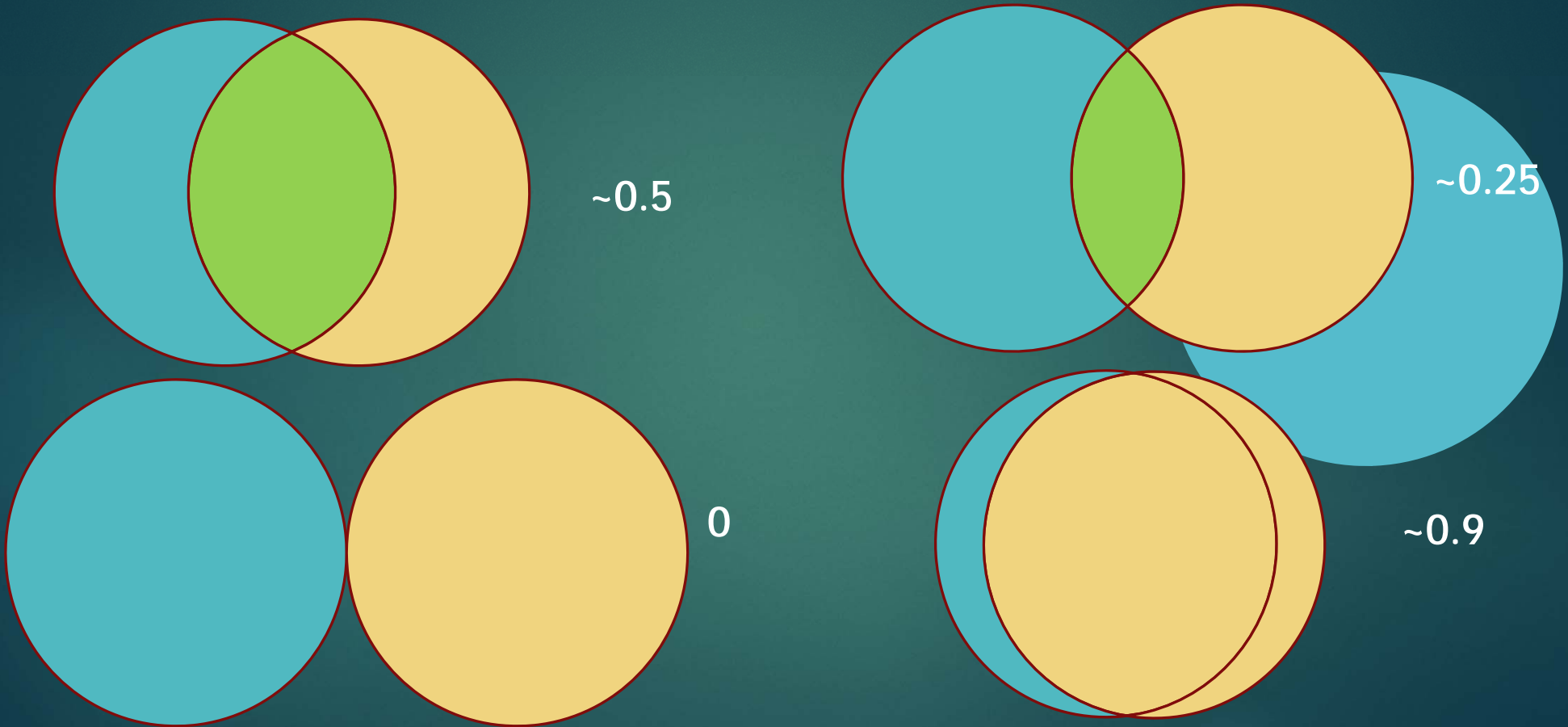
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- ▶ Data are collected to provide information.
- ▶ The value of data depends on the questions you ask and the quality of the answers you get.
- ▶ Sometimes we don't know what questions to ask until we have data.

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The value of information



PFAS Analysis Approaches

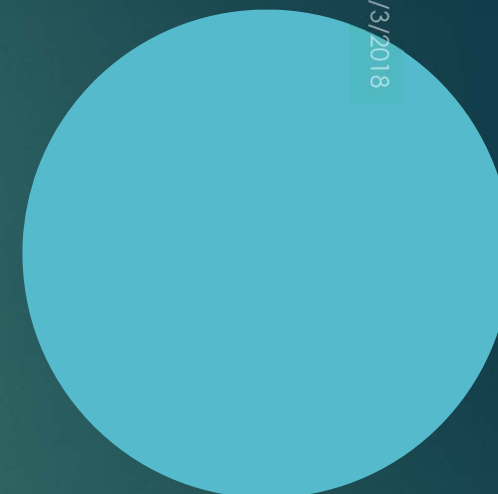
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- ▶ 1. EPA 537 – “Internal” standard
- ▶ 2. Isotope Dilution – uses isotopically labeled versions of the analytes
- ▶ 3. TOPS – Total oxidizable precursors – oxidizes all compounds it can to legacy PFAS for measurement.

Isotope Dilution vs. "Internal" Standard

	RSD Ratio	PD Ratio
Average	1.8	3.0
Median	1.8	2.1



What about TOPS?

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- ▶ TOPS is basically a highly uncertain lower limit
 - ▶ Proportion of precursors that can be oxidized is unknown
 - ▶ Extent of oxidation is unknown
 - ▶ Thus, the result, based on the measurement of legacy compounds, is a lower limit.

A comparison



Isotope Dilution:

The temperature will be between 20.9 and 23.1 degrees Celcius

“Internal” Standard:

The temperature will be between 19.8 and 24.2 degrees Celcius

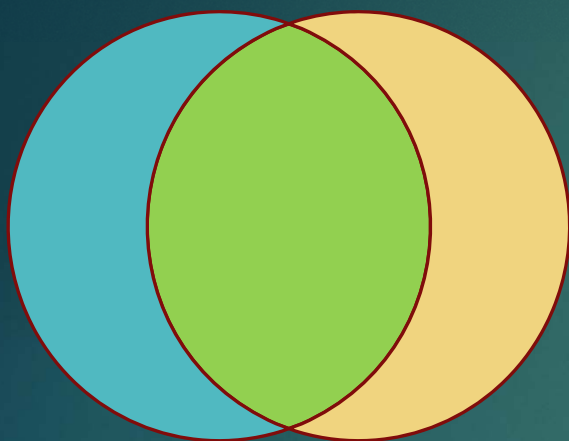
TOPS:

The temperature will be at least 27 degrees Celcius.

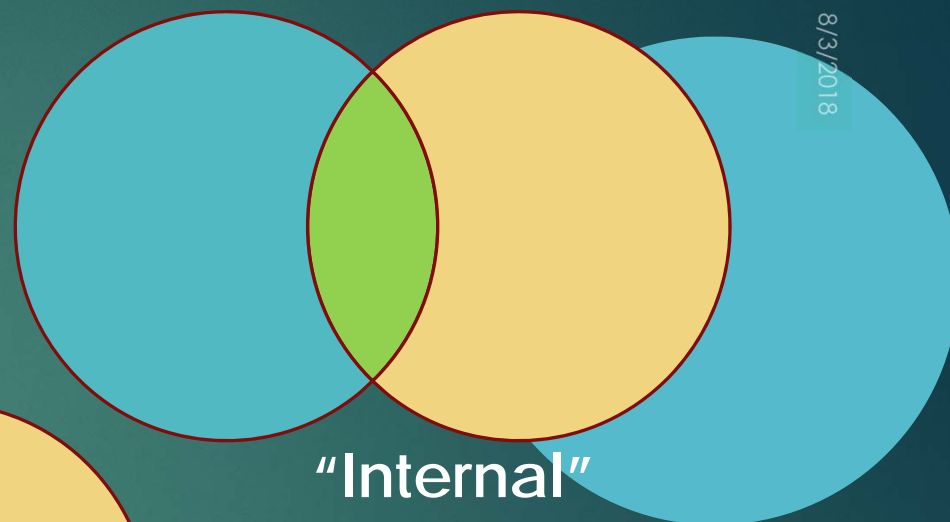
Information Value Scenario 1: What's the worst case?

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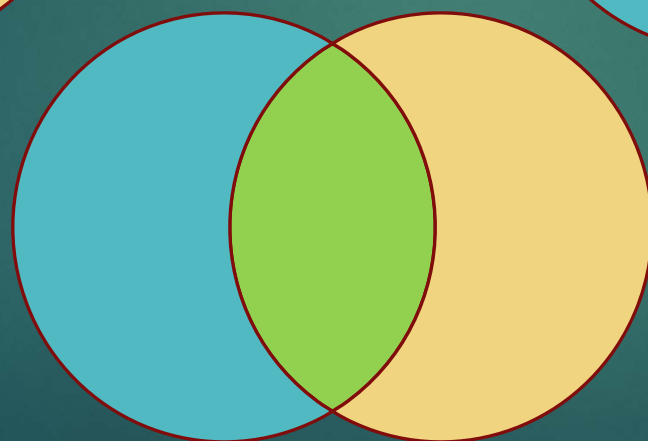
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TOPS



"Internal"
Standard



Isotope
Dilution

Information Value Scenario 2: What is the concentration of legacy PFAS in a sample?



Consider the needs before you gather the data

- ▶ Acknowledgements:
- ▶ Michael Allen
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