



Representative sampling? Views from a regulator and a measurement scientist

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The meaning of the term 'representative sampling' is unclear and often leads to undue optimism about both the quality of sampling and the reliability of the resultant measurement results and regulatory decisions. The term 'appropriate sampling' is preferable to describe sampling that gives rise to measurement values with uncertainties that are fit-for-purpose.

The phrase 'a representative sample was taken' is pervasive in scientific reports and published papers. But what does it really mean? Can we rely on the truth of the statement? Is there a better way to achieve our wider goal of reliable measurements and the dependable regulatory decisions that are based upon them?

The regulator's view

In the world of the environmental regulator, the question of 'how many samples from a site, or increments from a target, do I need to take to be representative?' has often been answered with the general advice 'more than you can afford or are prepared to fund'. Currently a compromise then tends to ensue where neither the regulator nor the regulated are happy.

Regulations in many sectors (i.e., environment, food, health) often set a level of compliance as a limit value (i.e., as a maximum, minimum or average value). Demonstrating compliance against this limit requires a sampling and analytical plan (SAP) that o

larger quantity of material is called a 'sampling target' and defined³ as a '