

# 5 Tips to Improving Your Sample Digestion: Trace Metals and Nutritional Food Analysis

Sample preparation is one of the most critical steps in your analytical process. Often accounting for 60% of your analytical timetable, it has a fundamental impact on laboratory throughput and analytical performance. Any errors within the sample preparation process will undermine the quality of your food data at all subsequent stages of your analysis. Here are five tips to improving your sample digestion for food samples:



## #1

### DESIGN YOUR METHOD TO USE THE SMALLEST SAMPLE WEIGHT

It's beneficial to design your digestion method targeting the smallest sample weight that will deliver the detection limits desired during subsequent instrument analysis. Samples that are larger than necessary can adversely affect the digestion method.

## #2

### USE NITRIC ACID AS YOUR GO-TO DIGESTION REAGENT

Nitric acid is the most commonly used digestion reagent and is readily available in high-purity form. It does not generate interferences or spectral difficulties on most inorganic analytical instruments and is compatible with nearly all sample introduction systems for AA, ICP-OES and ICP-MS.

## #3

### INCREASE THE RAMP TIME FOR STRONG EXOTHERMIC DIGESTIONS

Sample decomposition during digestion can be strongly exothermic and can occur rapidly. If the vessel pressure or temperature rises too quickly, reduce the sample weight and increase the ramp time of the digestion step where this occurs.

## #4

### DETERMINE THE RIGHT COMBINATION OF CHEMISTRY, HEATING AND TIME

Successful digestion of a sample is a combination of chemistry, heating, and time. Raising the temperature of the sample and reagents increases the rate of reaction and will shorten the digestion time. Use of appropriate reagents is critical. If Nitric Acid was not successful Hydrochloric, Hydrofluoric, and Sulfuric acids can be used, as well as a combination of any of the acids above.

## #5

### ADJUST YOUR DIGESTION BASED ON INITIAL RESULTS

While target temperatures are important, the end goal is successful digestion and minor temperature variations during digestion are normal. Fine tune the temperature, ramp and hold times, as well as re-evaluating the reagent blend based on initial results.

During digestion, pressure is generated as a byproduct of sample decomposition. If the vessel pressure is excessive, reduce the sample weight or the temperature of the method.

For more information on how PerkinElmer can help you detect metals in food visit [www.PerkinElmer.com/foodsafety](http://www.PerkinElmer.com/foodsafety)

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