

A Universal LC-MS/MS Method for the Quantification of Choline Containing Compounds and other Phospholipids in Foods and Animal Tissue

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Abstract

Measurements are needed to understand the current sources and forms of choline present in diets of various populations. Here, we report on the development and validation of an LC-MS/MS method to quantify all of the major choline-containing compounds found in a wide variety of foods. Tissues and food samples were spiked with isotopically labeled extraction recovery standards, synthesized in-house by established procedures, and by commercially available deuterated internal standards. HILIC chromatography was used coupled to positive ion electrospray mass spectrometry. The MS/MS method was optimized for each compound class so that the final method used a combination of precursor ion, fragment ion and neutral loss scans. In this way, 14 compounds or compound classes including 8 phospholipids and 6 choline containing compounds were quantified in a single LC-MS/MS method. Validation demonstrated that the method is sufficiently sensitive, and is accurate, precise and linear over two orders of magnitude. Recoveries in the range of 90% to 115% were obtained by spiking a range of sample matrices with authentic standards containing all of the target analytes. The total choline content of a large number of foods and tissues has been obtained using the validated method.