

# 野菜・果実中の残留農薬分析における試料調製方法及び試料量による 分析値のばらつきへの影響

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## Effects of sample processing method and analytical portion size on variations in the analytical values of pesticide residues in vegetables and fruits

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### Abstract

Reducing the analytical portion size during pesticide residue analysis can potentially reduce the amounts of organic solvents and reagents used, as well as the time required for analysis. However, if sample processing is not performed properly and the concentration distribution of the pesticide residues in the homogenized sample is not uniform, the analytical portion may not represent the original sample, thereby leading to large variations in analytical values and incorrect results. In this study, we compared variations in the analytical values of incurred residues in various vegetable and fruit portions of different size (2–20 g) in order to examine how portion size affects the analytical values obtained during pesticide-residue analysis. The results show that variations in the analytical values are relatively small (relative standard deviation <10%) for foods that can form homogeneous samples relatively easily when appropriate sample processing methods were employed, even when a 2-g analytical portion was used for analysis. In contrast, for foods such as grapes that are not easily homogenized, large variations in the analytical values were observed for analytical portions less than 5 g in size due to variations in the distributions of pesticide residues in the sample. Furthermore, to examine the effect of the sample processing method on sample homogeneity, variations in the analytical values of incurred residues in tomato were compared using three methods, namely sample processing at room temperature using a household food processor, laboratory-knife milling, and cryogenic milling. Sample processing using a household food processor was found to provide large variations in the analytical values (relative standard deviation >20%), even when a 20-g portion was used for analysis. The results show that, compared to the other two methods, sample processing at room temperature using a household food processor may not provide sufficiently homogeneous samples.

**Keywords** : 農薬、野菜、果実、試料量、試料調製  
pesticide, vegetable, fruit, analytical portion size, sample processing

## I 緒言

現在、我が国の残留農薬等の公示試験法 (野菜・果実の場合) では、分析に供する試料量は 20.0 g となっている。しかし近年、LC-MS/MS や GC-MS/MS 等の測定装置の感度は大幅に向上しており、20.0 g より少量の試料を用いて分析することも可能である。欧米において汎用

されている簡易法の QuEChERS 法<sup>1)</sup> (野菜・果実の場合) の試料量は、我が国の公示試験法の試料量よりも少量 (CEN Standard Method EN 15662 では 10 g、AOAC Official Method 2007.01 では 15 g) である。分析に供する試料量を少量化することができれば、使用する溶媒・試薬量の削減や濃縮等の操作時間の短縮が可能となり、検査の迅速化やコスト削減が期待される。