In-house validation of a method for determination of silver nanoparticles in chicken meat based on asymmetric flow field-flow fractionation and inductively coupled plasma mass spectrometric detection

Nanomaterials are increasingly used in food production and packaging, and validated methods for detection of nanoparticles (NPs) in foodstuffs need to be developed both for regulatory purposes and product development. Asymmetric flow field-flow fractionation with inductively coupled plasma mass spectrometric detection (AF4-ICP-MS) was applied for quantitative analysis of silver nanoparticles (AgNPs) in a chicken meat matrix following enzymatic sample preparation. For the first time an analytical validation of nanoparticle detection in a food matrix by AF4-ICP-MS has been carried out and the results showed repeatable and intermediately reproducible determination of AgNP mass fraction and size. The findings demonstrated the potential of AF4-ICP-MS for quantitative analysis of NPs in complex food matrices for use in food monitoring and control. The accurate determination of AgNP size distribution remained challenging due to the lack of certified size standards.

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