

Results of an interlaboratory method performance study for the size determination and quantification of silver nanoparticles in chicken meat by single-particle inductively coupled plasma mass spectrometry (sp-ICP-MS) - DTU Orbit (09/11/2017)

Results of an interlaboratory method performance study for the size determination and quantification of silver nanoparticles in chicken meat by single-particle inductively coupled plasma mass spectrometry (sp-ICP-MS)

Single-particle inductively coupled plasma mass spectrometry (sp-ICP-MS) promises fast and selective determination of nanoparticle size and number concentrations. While several studies on practical applications have been published, data on formal, especially interlaboratory validation of sp-ICP-MS, is sparse. An international interlaboratory study was organized to determine repeatability and reproducibility of the determination of the median particle size and particle number concentration of Ag nanoparticles (AgNPs) in chicken meat. Ten laboratories from the European Union, the USA, and Canada determined particle size and particle number concentration of two chicken meat homogenates spiked with polyvinylpyrrolidone (PVP)-stabilized AgNPs. For the determination of the median particle diameter, repeatability standard deviations of 2 and 5% were determined, and reproducibility standard deviations were 15 and 25%, respectively. The equivalent median diameter itself was approximately 60% larger than the diameter of the particles in the spiking solution. Determination of the particle number concentration was significantly less precise, with repeatability standard deviations of 7 and 18% and reproducibility standard deviations of 70 and 90%.

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