Se metallomics during lactic fermentation of Se-enriched yogurt

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Abstract

Selenium biotransformation by lactic acid bacteria during the preparation of Se-enriched yogurt was evaluated. The study focused on the distribution of selenium in the aqueous soluble protein fraction and the detection of selenoamino acids. Screening of selenium in Tris-buffer-urea soluble fraction was carried out by sodium dodecyl sulfatesulfate polyacrylamide gel electrophoresis after pre-fractionating with asymmetric field flow fractionation using inductively coupled plasma-mass spectrometry as the detector. Selenium-containing fractions were identified by peptide mapping using nano LC-ESI/LTQMS. Proteins such as thioredoxin, glutaredoxin, albumin, β-lactoglobulin, and lactoperoxidase were identified in the selenium-containing fraction. All these proteins were detected in both the control and the selenium-enriched yogurt except chaperones, which were only detected in the control samples. Chaperones are heat-shock proteins expressed in response to elevated temperature or other cellular stresses. Selenium may have an effect on chaperones expression in *Lactobacillus*. For the amino acids analysis, selenocysteine was the primary seleno-containing species.