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Study of selenium-containing metabolomes in selenium-enriched yeast by ion exchangeinductively coupled plasma-mass spectrometry

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Selenium (Se) is an essential micronutrient required by both animals and humans and Se-Yeast is an attractive supplementary source of Se. As diverse Se-compounds can be nutritional source and their chemical structures affect their absorption and distribution and their nutritional bioavailability, toxicity and disease preventive activity have been found to species-dependent, Se-containing metabolomes in Se-Yeast had been identified and quantified by speciation technique using ion-exchange-inductively coupled plasma mass spectrometry (IC-ICP-MS). The Se-compounds were extracted by enzymatic (Proteinase-XIV) digestion from Se-Yeast sample. The different Se biomolecules were separated by ion-exchange chromatography using gradient elution and simultaneously detected by ICP-MS at ⁷⁸Se isotope on Time Resolves Analysis (TRA). The presence of Se-metabolomes (Se-Methionine, Se-Cysteine, Se-Methyl-Se-Cysteine, Selenite and Selenate) in Se-Yeast product contained two Se-metabolites – Se-Methionine (56%) and Se-Cysteine (24%), the two organic forms of Se out of a total Se of 2340µg/g of dry yeast. These organic forms may have higher bioavailability in animals and humans as compared to inorganic sources of supplements (selenite or selenate). The information for individual Se-species may provide a better understanding for potential animal and human health benefits.

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