

Introduction

- The possible benefits of selenium (Se) are particularly important in the first years of life.
- Se levels are greater in breast-fed infants compared to levels in formula-fed infants.
- The Se source in infant formula comes from cow milk or is fortified in the formulae.
- The form of Se (Se species) that the formula is fortified with, plays a role in the bioavailability of Se.
- In breast milk no inorganic Se forms are measured, however it is applied as the main species for fortification.
- Plant based proteins contain lower concentrations of Se

Which Se species are found in different infant formulae?

What is the contribution of infant formula to the Se intake in infants and toddlers?

Methodology

- A limited set of 25 infant formulae and 15 milk samples (cow milk and vegetable milk) are sampled
- Total Selenium (Se) is analysed via ICP-MS (Agilent 8800)
- Selenomethionine (SeMet), Selenite (SeIV) and Selenate (SeVI) are analysed via HPLC-ICP-MS (anion exchange PRP-X 100 - Varian 720MS) after enzymatic extraction (4 mg/L protease and 2 mg/L lipase, pH 7.5)
- The percentage daily intake (DI) compared to adequate intake (AI) as established by the EFSA NDA panel is calculated

Results and Discussion

- Se content in vegetable milks is lower compared to cow milks.
- SeMet is the main species in cow milk and vegetable milks
- Part of the SeMet is retained in the infant formula, extra Se is fortified as inorganic form
- The adequate intake is mostly met for starter formulae. For follow-up and hydrolysed formulae not always.
- In vegetable based formulae, the AI is not met.

Conclusion and challenges

- Infant formulae derived from plant proteins do contain less Se and the specie used for fortification is mostly SeIV, the least absorbed Se form.
- Special attention is needed for vegetable based diets as Se intake is not met by the consumption of the infant formula only
- As speciation plays a role in absorption of Se, total Se values are not a correct indicator for the nutritional status of the infant formula

Literature

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