Optimal intake of vitamins and minerals

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Vitamins and minerals are essential substances that are of great importance for good health. Due to the fact that they are not naturally synthesized by the human body, they need to be absorbed through the consumption of food.
RNI - referent nutrient intake
Recommended Dietary Allowances (RDA)

Represents adequate, average, and safe doses of each individual vitamin and mineral necessary for regular function of the metabolic process and good health of the human organism.
Dietary Reference Intake (DRI) represent newly formulated averages that can be used instead of the RDA for specific minerals and vitamins.

First DRI averages were published in 1997 and were based on previous RDA averages.
The Scientific Committee of Food EU (European Commission) uses the upper level of the Tolerable Upper Intake Level (TUL or UL) as the maximum quantity of allowable intake of vitamins and minerals that will not have any adverse effects on the human organism.

TUL is not recommended level of intake.
The National Academy of Sciences (USA) also uses the Tolerable Upper Intake Level as a warning of excessive intake of such micronutrients.

The Expert Group on Vitamins and Minerals (GB) has established a safe, maximum level of daily intake for specific vitamins and minerals, also known as Safe Upper Level (SUL) that can be safely consumed without any adverse effects. For all other vitamins and minerals that don’t have an established Safe Upper Level of intake, it is recommended to use the Guidance Level as the maximum value of daily intake that is believed not to cause any adverse effects.
HAZARD IDENTIFICATION

The Codex definition of hazard identification is: the identification of biological, chemical (vitamins or minerals) and physical agents capable of causing adverse health effects and which may be present in particular food or group of foods.
HAZARD CHARACTERIZATION

The Codex definition of hazard characterisation:
The qualitative and quantitative evaluation of the nature of the adverse health effects associated with biological, chemical and physical agents which may be present in food.

For chemical agents (vitamin and mineral) a dose-response assessment should be performed.
Theoretical dose-response relationships in humans

- Deficiency
- Acceptable Range of Intake
- NOAEL
- Toxicity
- LOAEL

NOAEL = No Observed Adverse Effect Level
LOAEL = Lowest Observed Adverse Effect Level
EXPOSURE ASSESSMENT

The Codex definition of exposure assessment is: the qualitative and quantitative evaluation of the likely intake of biological, chemical and physical agents (nutrient) via food as well as exposures from other sources if relevant.
RISK CHARACTERISATION

The Codex definition of risk characterisation is: the qualitative and quantitative estimation, including attendant uncertainties, or the probability of occurrence and severity of known or potential adverse health effects in a given population based on hazard identification, hazard characterisation and exposure assessment.