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Do they do what they say on the tin? A comparison of labelled vs measured zinc and selenium levels in food supplements

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Zinc and selenium food supplement notifications have increased between 2018–2022 by $n = 436$ and $n = 98$ respectively to the Food Safety Authority of Ireland (FSAI). Variation is normal between labelled and measured nutrient content of foods. The European Commission's Nutrition Tolerances Guidance (2012) sets out permitted labelling tolerances for minerals in food supplements (+45%, -35%) from measured values. For official controls purposes, competent authorities conduct sampling to ensure safety against Tolerable Upper Intake Levels (UL)⁽¹⁾ and conformance and compliance of food supplements placed on the Irish market as excessive nutrient intakes can result in negative health outcomes. Excessive zinc intake is associated with gastrointestinal disturbances, while chronic toxicity can result in anaemia, neutropenia and bone abnormalities. Excess selenium results in nail abnormalities, skin lesions and changes in peripheral nerves⁽²⁾.

The study aimed to: 1) investigate percentage difference between labelled and measured values 2) assess measured values against labelling tolerances and 3) identify risks, for zinc and selenium single nutrient and multivitamin food supplements on the Irish market against high consumers (95th percentile) intake data⁽³⁾.

Zinc and selenium supplements intended for adults and/or children >1year, were sampled by environmental health officers and measured by Galway Public Analyst Laboratory using accredited methods, 1st-12th November 2021. Measured and labelled values were assessed against permitted tolerances and risks identified for high consumers (95th percentile) using relevant population groups of the ULs. Data were analysed using SPSS version 28.

Zinc ($n = 21$) and selenium ($n = 18$) containing supplements were measured. Zinc (86%) and selenium (78%) samples contained less than the labelled value (zinc, 1%-31%; selenium 0.7%-99%). No variation was found in one zinc and one selenium supplement. Most sampled supplements (89%) conformed with nutrient labelling tolerances. Risk analysis of zinc dietary intake data (95th percentile) revealed 41% of zinc containing supplements exceeded the UL across the 8 population groups by up 86%. Irish dietary intake data for selenium is unavailable, therefore supplements were compared to the UL only and no risks were identified for any population.

In general, measured values were reportedly lower than labelled values for both nutrients, with the majority meeting the permitted nutrient tolerances. A risk was identified for some population groups in exceeding the UL when dietary intake data were considered if certain zinc supplements are consumed, especially for two population groups where Irish dietary intakes pre-exceed the UL, potentially skewing the results observed. Due to confounding factors affecting zinc absorption and reported absorption rates from supplements (50–61%), this risk may be reduced⁽⁴⁾.

Continuous monitoring by the FSAI is important to ensure conformance, compliance and safety of food supplements on the Irish market. Establishment of selenium intake data for the Irish population should be prioritised to assist in robust safety assessment of food supplements.

References

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