



## Reading the labels: mineral doses in food supplements

Joana Simões, Isabel Margarida Costa, Alexandra Figueiredo, Guilhermina Martins Moutinho & Maria Deolinda Auxtero

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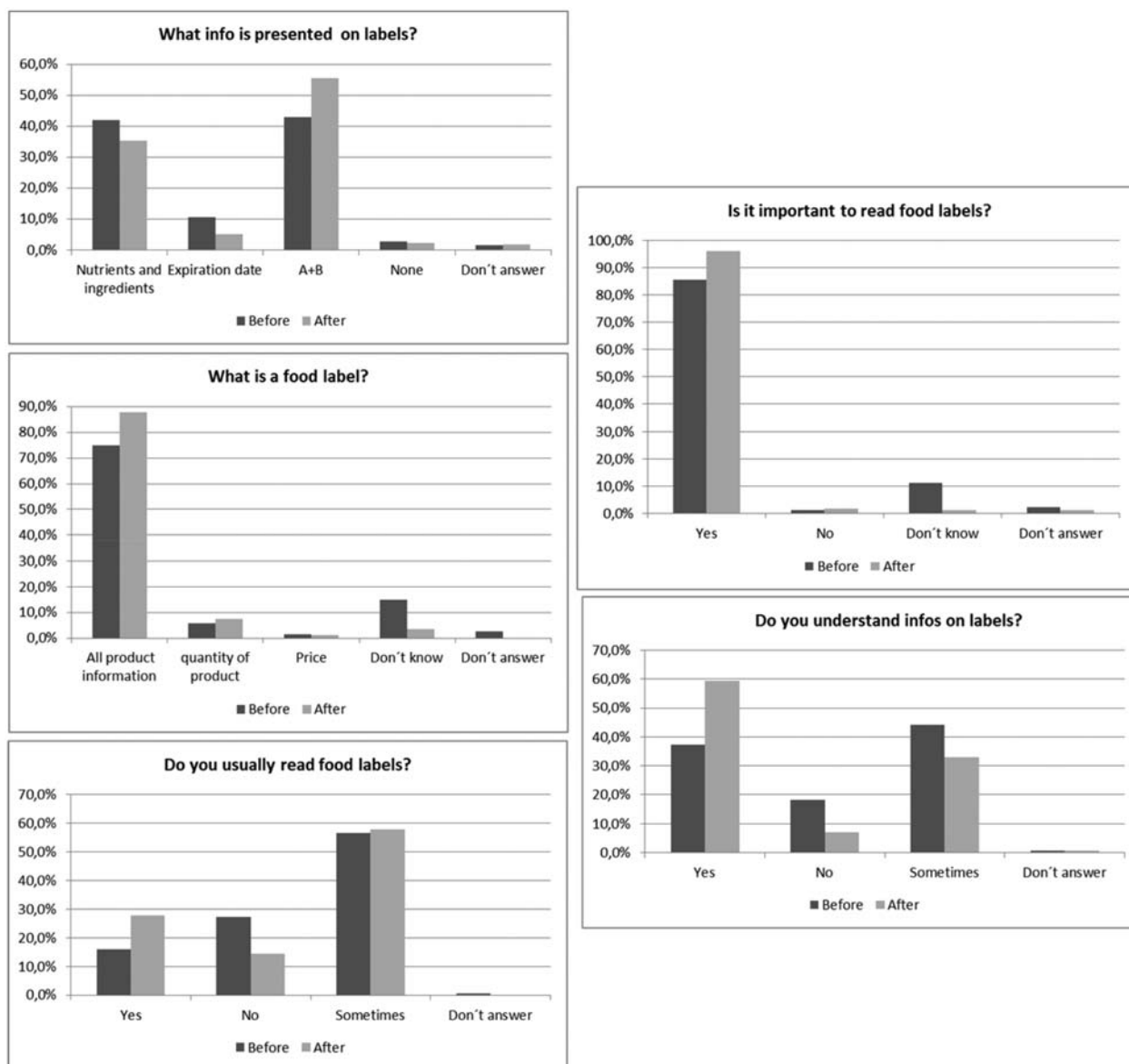
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**Figure 1.** Effect of educational-based intervention on food label knowledge and behaviour. Answers with major improvement are presented.

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## Reading the labels: mineral doses in food supplements

Joana Simões<sup>a,b</sup>, Isabel Margarida Costa<sup>a,b</sup>, Alexandra Figueiredo<sup>a,b</sup>, Guilhermina Martins Moutinho<sup>a,b</sup> and Maria Deolinda Auxtero<sup>a,b</sup>

<sup>a</sup>CiiEM, Centro de Investigação Interdisciplinar Egas Moniz; <sup>b</sup>IUEM, Instituto Universitário Egas Moniz

**Introduction:** Food Supplements (FS), used regularly by many adults, can add significant amounts of nutrients and other ingredients, such as minerals, to the diet. Although the Recommended Daily Allowance (RDA) for most nutrients is mainly

provided by diet, mineral supplements (MS) are one of the largest growing category of FS used. Given the high prevalence of MS use among consumers and their potential for drug interactions [1], as well as adverse effects of excess consumption, special attention should be given to the Label Recommended Daily Dose (LRDD). As intake increases above the Tolerable Upper Intake Level (UL), the potential risk of experiencing adverse effects may rise [2]. The aim of this study was to evaluate if LRDD of MS are in conformity with the RDA defined by European Union Directive [3].

**Materials and methods:** A total of 210 FS sold in Portuguese pharmacies, supermarkets, health shops and on internet were examined for LRDD of 14 minerals (Ca, Cl, Cr, Cu, Fe, F, I, K, Mg, Mn, Mo, P, Se and Zn). Selection criteria: oral solid pharmaceutical forms for adults, containing any of the 14 minerals, as stated in the label, regardless of the purpose of its use.

**Results:** 56% of FS labels presented LRDD of at least one mineral > RDA and 6% of FS indicated LRDD > RDA, for 7 or more minerals. For most minerals (excluding Cl, F and K), Maximum Label Recommended Daily Dose (MLRDD) is much higher than RDA, with some FS mentioning doses of Se and Zn above UL defined by EFSA [2] (Table 1).

**Discussion and conclusions:** It is noteworthy that some minerals can be harmful in large doses with risk of oral and systemic manifestations: e.g. excess of Zn may promote hypocupremia, anemia, gait and balance disorders and paresthesias; excess of Se can cause alopecia, hair and nail brittleness and garlic odor to breath. This study revealed that, for most minerals, the majority of FS labels recommended daily doses above RDA and some even above UL. Therefore, it is crucial to review doses of minerals present in FS ensuring the safety of these products.

CONTACT Maria Deolinda Auxtero  [mauxtero@egasmoniz.edu.pt](mailto:mauxtero@egasmoniz.edu.pt)

**Table 1.** Results of FS containing minerals.

Mineral Unit	Ca mg	Cl mg	Cr µg	Cu mg	Fe Mg	F mg	I µg	K mg	Mg mg	Mn mg	Mo µg	P mg	Se µg	Zn mg
Number of FS	100	5	102	132	104	4	94	32	136	116	53	40	123	156
RDA	800	800	40	1	14	3.5	150	2000	375	2	50	700	55	10
LRDD > RDA (%)	5	0	49	31	21	0	16	0	7.4	34	34	2.5	49	50
UL	2500	ND	250	5	ND	7	600	ND	250*	ND	600	ND	300	25
LRDD > UL (%)	0	–	0	0	–	0	0	–	22	–	0	–	1	3
MLRDD*	2040	314	240	3	42	1.8	451	340	600	20	600	1215	400	31

\*Does not include Mg present in diet; ND: Not defined

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## Fat-soluble vitamins in food supplements: do the labels follow the recommended doses?

Isabel Margarida Costa, Alexandra Figueiredo, Guilhermina Martins Moutinho and Maria Deolinda Auxtero

CiiEM, Centro de Investigação Interdisciplinar Egas Moniz; IUEM, Instituto Universitário Egas Moniz

**Introduction:** Adequate vitamins consumption is indispensable for the maintenance of health and to prevent disease. Both poor and overdose intakes may result in adverse health effects [1]. Recommended Daily Allowance (RDA) is the average daily level intake sufficient to meet the nutrient requirements of nearly all (97-98%) healthy individuals [2]; Tolerable Upper Intake Level (UL) is the maximum level of total chronic daily intake of a nutrient judged to be unlikely to pose a risk of adverse health effects to humans [3]. Owing the ability of fat-soluble vitamins to accumulate in the liver and adipose tissue, they present a higher potential for toxic effects than water-soluble vitamins. The aim of this study was to evaluate if daily doses of fat-vitamins (vit) mentioned in food supplements (FS) labels are in conformity with the RDA defined by European Union Directive [4].

**Materials and methods:** A total of 165 FS sold in Portuguese pharmacies, supermarkets, health shops and on internet were examined for indicated daily intake and dosage of vitA, vitD, vitE and vitK. Selection criteria: oral solid