# IMPACT OF FOOD ADDITIVES AND OF FOOD SUPPLEMENTS ON AGRO-ALIMENTARY PRODUCE

# INFLUENŢA ADITIVILOR ALIMENTARI ŞI A SUPLIMENTELOR ALIMENTARE ASUPRA PRODUSELOR AGROALIMENTARE

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***Abstract:*** *Food additives can be chemical hazards in the food industry. Food additives that improve finite produce quality (smell, taste, aspect, enhancing properties), colour them, o play the role of excipients can cause toxic effects because of the faulty dosage. Are considered food additives the following: antioxidants, aroma agents, colorants, preservatives, emulsifiers, sweeteners, and aroma enhancers. Among food additives, only emulsifiers (substances that make possible the moulding and maintenance of homogeneous mixtures, such as lecithin – E 322, salts of fatty acids – E 470, glycerides – E 471-E 472, etc.) are frequently used in the manufacture of food produce, particularly in bread-making.*

***Keywords:*** *food additives, food produce, influence*

## INTRODUCTION

Sanitary legislation in Romania, unlike most countries of the European Union, and unlike Canada or the U.S.A., does not allow the use of potassium bromate as treating agent because potassium bromide resulted from bromated reduction has a carcinogenic effect [1, 3].

In Australia, for instance, they use in bread-making the preservatives shown in Table 1.

Table 1. Australian codes of common food additives

| **Number** | **Preservative** | **Food it is used in** |
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| 200-203 | Sorbic acid and sorbates | - refreshing drinks<br>- cheese<br>- dried fruits<br>- **bread**<br>- fruit juices<br>- wine |
| 280-282 | Propionic acid and propionates | - **bread**<br>- **other flour-based produce** |

Source: Cerexhe, P. & Ashton, J. (2000). *Risky Foods, Safer Choices. Avoiding Food Poisoning.* Sydney: UNSW Press

Bread and similar produce contain emulsifiers that maintain freshness and allow dough to be better processed in mass production. Emulsifiers are used in ice-cream, cakes, whipped cream, sauces, and feta cheese [2].

## MATERIAL AND METHOD

**The goal of the present approach is to study what makes both consumers and specialists in the agro-alimentary field ask such questions as**: What type of research backs up advertisements? Do the effects of different mineral elements differ between them? Are these mineral supplements beneficial only in case of lack of minerals or is it good to consume them in amounts larger than the usually recommended ones? What food safety issues do mineral supplements generate? We try to answer these questions below.

## RESULTS AND DISCUSSION

The issue of minerals safety as nutrition supplements in foods is not a new one. While documenting this topic, we found a method patented in the U.S.A., in 1924, by an Italian resident in Bucharest, Luigi Negro [6]. To our great surprise, Negro militated for the use of whole meal in bread-making because it allowed the use of all the minerals in the grain caryopsis without altering minerals or gluten. To reach this desideratum, Negro asked, in 1920, the patent for an apparatus meant to dry and warm up wheat allowing the removal of diastasis in the wheat kernel and of the embryo and, implicitly, the improvement of the aspect of bread and similar produce and the removal of the sour taste of the produce.

Television, the Internet, and magazines are full of advertisements for nutrition supplements. A category of nutrition supplements that has increased significantly lately and that is expected to increase in the near future is that of **mineral supplements**.

With the increase of dietary supplements, there is also increase of concern related to some ingredients, including possible interactions with negative effects between supplements and medicines prescribed to patients.

Below are the main minerals (in strict alphabetical order) used as nutrition supplements in the recipes of different agro-alimentary produce [4, 5].

Table 2. Main minerals used as nutrition supplements in the recipes of different agro-alimentary produce

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| ***BORON***<br>**Adult requirements**: not known.<br>**Typical dose in studies concerning the supplements**: not known.<br>**The best supplement complex**: not known.<br>**Applications**: stimulating other mineral functions, particularly for bone health.<br>**Maximum admitted level**: not known.<br>**Safety issues**: not known. |
| ***CALCIUM***<br>**Adult requirements**: 1,000 mg.<br>**Typical dose in studies concerning the supplements**: 400-1000 mg (optimal dose per application not known). |

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| **The best supplement complex**: there are some acceptable for most people; in some cases, a complex can be better than another one.<br>**Applications**: good in the treatment of rachis; seems to be good in the treatment of other diseases of the bone-system (though calcium from dairy produce is also a good alternative); promising in weight loss and in cholesterolemia; beneficial in blood pressure, but they do not know how beneficial.<br>**Maximum admitted level**: not known.<br>**Safety issues**: possible negative interactions with other minerals (magnesium, lead) whose practical importance is controversial. |
| ***CHROMIUM***<br>**Adult requirements**: 35 mg (men), 25 mg (women).<br>**Typical dose in studies concerning the supplements**: 200-1,000 mg (efficient dose debatable).<br>**The best supplement complex**: picolinate or nicotinate (controversial).<br>**Applications**: not known; the best candidates are glycaemia and lipemia.<br>**Maximum admitted level**: not known.<br>**Safety issues**: picolinate is debatable. |
| ***COPPER***<br>**Adult requirements**: 0.9 mg (controversial).<br>**Typical dose in studies concerning the supplements**: 2-5 mg.<br>**The best supplement complex**: not known; glycinate or sulphate; gluconate can be good, but it is not enough tested; oxide is used currently, but it was not enough tested on animals.<br>**Applications**: increases enzymatic activity in some people; possible beneficial effects on health.<br>**Maximum admitted level**: 10 mg.<br>**Safety issues**: absent when consumed below maximum admitted level. |
| ***IRON***<br>**Adult requirements**: 18 mg (men), 8 mg (women).<br>**Typical dose in studies concerning the supplements**: variable but, in anaemia correction, it can reach 300 mg/day.<br>**The best supplement complex**: iron sulphate is the cheapest and it absorbs the best, but some doses can cause irritation of the gastro-intestinal tract.<br>**Applications**: beneficial in treating anaemia, possible beneficial in preventing anaemia, good in pregnancy.<br>**Maximum admitted level**: 45 mg.<br>**Safety issues**: confirmed only in over-dose cases (particularly in children). |

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| ***PHOSPHORUS***<br>**Adult requirements**: 700 mg.<br>**Typical dose in studies concerning the supplements**: variable.<br>**The best supplement complex**: not known.<br>**Applications**: in sports (debatable, but possible).<br>**Maximum admitted level**: 4 mg.<br>**Safety issues**: not known. |
| ***IODINE***<br>**Adult requirements**: 150 g.<br>**Typical dose in studies concerning the supplements**: variable.<br>**The best supplement complex**: not known.<br>**Applications**: treating serious and marginal deficiencies; possible in cystic breast fibrosis.<br>**Maximum admitted level**: 1,100 g.<br>**Safety issues**: not known. |
| ***MAGNESIUM***<br>**Adult requirements**: 420 g (men), 320 g (women).<br>**Typical dose in studies concerning the supplements**: 300-600 mg.<br>**The best supplement complex**: organic complexes are, in general, considered more attractive than inorganic ones, except for liquid chlorine; present data are debatable; amino acid chelates and lactate are among the best for gastro-intestinal tolerance; certain complexes with magnesium can act better in certain specialised applications.<br>**Applications**: treating hypo magnesia.<br>**Maximum admitted level**: 350 mg from supplements (based on gastro-intestinal tract symptoms); doses can be larger if daily doses are fewer.<br>**Safety issues**: typical supplement doses are considered safe for good kidney function, except for gastro-intestinal symptoms, particularly diarrhoea. |
| ***MANGANESE***<br>**Adult requirements**: not known.<br>**Typical dose in studies concerning the supplements**: 5-15 mg (minimum efficient dose unknown).<br>**The best supplement complex**: not known.<br>**Applications**: possible diseases of the osteoarticular system; probably as antioxidant.<br>**Maximum admitted level**: 10 mg (controversial).<br>**Safety issues**: dose necessary to cause neurological issues in sensitive |

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| people not known. |
| ***POTASIUM***<br>**Adult requirements**: not known.<br>**Typical dose in studies concerning the supplements**: 900-1,200 mg (maximum efficient dose not known).<br>**The best supplement complex**: numerous complexes seem to have a good absorption.<br>**Applications**: treating hypertension, in association with other medicines; foods rich in potassium.<br>**Maximum admitted level**: not known.<br>**Safety issues**: most people cannot consume toxic levels. |
| ***SELENIUM***<br>**Adult requirements**: 55 g (can cover its basic function without maximising the protection action against health issues not necessarily related to selenium deficiency).<br>**Typical dose in studies concerning the supplements**: 55 g preventive or 200 g curative.<br>**The best supplement complex**: selenite, selenate, L-selenomethionine (as such or in yeast) with good absorption; L-selenomethionine is more bio-active than the others.<br>**Applications**: preventing some forms of cancer, treating chronic pancreatitis, supporting epileptic children with ketogene diet; immune and antioxidant effects, nutrition support for HIV people; treating/preventing arthritis, treating reproduction issues.<br>**Maximum admitted level**: 400 g (below the amount causing toxicity symptoms).<br>**Safety issues**: speculations related to cancer-risk. |
| ***SILICIUM***<br>**Adult requirements**: not known.<br>**Typical dose in studies concerning the supplements**: not known.<br>**The best supplement complex**: not known.<br>**Applications**: maintaining connective tissue involved in the bone and cardio-vascular systems.<br>**Maximum admitted level**: not known.<br>**Safety issues**: not known. |
| ***VANADIUM***<br>**Adult requirements**: not known.<br>**Typical dose in studies concerning the supplements**: not known. |

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| **The best supplement complex**: not known.<br>**Applications**: treating diabetes.<br>**Maximum admitted level**: 1.8 mg.<br>**Safety issues**: can affect the body with high doses in the treatment of diabetes. |
| ***ZINC***<br>**Adult requirements**: 11 mg (men), 8 mg (women).<br>**Typical dose in studies concerning the supplements**: variable (there are no response curves to doses).<br>**The best supplement complex**: oxide is less desirable; other complexes are well absorbed.<br>**Applications**: correcting zinc deficiency; not enough confirmed in the Down syndrome and in kidney dialysis; possible use in diabetes or in under-developed children; not confirmed in preventing osteoporosis; used in treating colds; debatable in treating acne.<br>**Maximum admitted level**: 40 mg (not enough tested).<br>**Safety issues**: risk of copper deficiency; minimum safe dose not known. |

## CONCLUSIONS

Minerals used as nutrition supplements in foods play a very important role. Thus, there are consistent data concerning the use of the following minerals: **calcium** used in the nutrition of menopause women (when osteoporosis incidence is very high because of the specific hormone slow down) who can get their necessary calcium from bread fortified with three mineral salts and with $CaSO_4$ ; **selenium**, necessary for normal development and normal health, can be overtaken from selenium bread; **zinc** deficiency is frequent in areas where they eat bread without yeast, rich in phytate: this deficiency can be corrected through the consumption of bread and similar produce with zinc addition as zinc oxide or zinc sulphate.

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