



## Determination of metals and minerals in food supplements

Contamination with toxic heavy metals and their adverse health impacts are major environmental problems in the world. Heavy metals are high-density elements that can be toxic at high levels.

Metals can occur as residues in food because of their presence in the environment, as a result of human activities such as farming, industry or from contamination during food processing and storage. People can be exposed to these metals from the environment or by ingesting contaminated food or water. Their accumulation in the body can lead to harmful effects over time.<sup>3</sup>

Commission Regulation (EU) 915/2023 sets, amongst others, maximum levels for Pb, Cd and Hg in food supplements (see **Table 1** below):

Heavy metals	Matrices	Maximum levels (mg/kg wet weight)
Lead	Food supplements	3,0
Cadmium	Food supplements, except food supplements listed in point 3.2.21.2 ( <i>see below</i> )	1,0
	Food supplements consisting exclusively or mainly of dried seaweed, products derived from seaweed, or of dried bivalve molluscs	3,0
Mercury	Food supplements	0,10

**Table 1:** Maximum levels of heavy metals in food supplements (Reg. (EU) No 915/2023 as amended<sup>1</sup>).

For details, please see the Annex to Regulation (EC) No 915/2023 as amended, at the following link:

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02023R0915-20230810&qid=1698404791609>.

### Neutron proposal

Neutron performs the analysis of lead, cadmium, mercury and arsenic by ICP-MS technique.

Regarding the inorganic arsenic detection, we offer 2 validated and accredited analytical methods: one through an internal method by ICP-MS and another performed by the chromatographic separation of arsenic species by HPLC-ICP-MS technique according to UNI EN 16802:2016 standard<sup>2</sup>.

Accredited matrices (UNI EN 16802:2016 standard): fruits and vegetables, cereals and cereals by-products, meat, fish, milk and dairy products, oils and vegetable fats, food products, additives, and food supplements.

Moreover Neutron performs the analysis of the following metals and heavy metals as per below details by ICP-MS technique with the limit of quantification of 0,005 mg/kg:

Arsenic as As	Manganese as Mn
Cadmium as Cd	Molybdenum as Mo
Mercury as Hg	Nickel as Ni
Lead as Pb	Palladium as Pd
Antimony as Sb	Rubidium as Rb
Aluminium as Al	Scandium as Sc
Barium as Ba	Selenium as Se
Berillium as Be	Silver as Ag
Bismuth as Bi	Strontium as Sr
Boron as B	Tellurium as Te
Cesium as Cs	Thallium as Tl
Chromium as Cr	Thorium as Th
Cobalt as Co	Tin as Sn
Copper as Cu	Titanium as Ti
Gold as Au	Tungsten as W
Iron as Fe	Uranium as U
Lanthanum as La	Vanadium as V
Lithium as Li	Zinc as Zn
	Zirconium as Zr

Furthermore Neutron offers analysis of the following minerals by ICP-AES technique which may be declared in food supplements:

Iron as Fe	Phosphorus as P
Copper as Cu	Potassium as K
Manganese as Mn	Silicium as Si
Tin as Sn	Sodium as Na
Calcium as Ca	Sulphur as S
Magnesium as Mg	Iodine (by ICP-MS)

For more information contact us: [www.neutron.it](http://www.neutron.it)

### References:

1. Commission Regulation (EU) 2023/915 of 25 April 2023 on maximum levels for certain contaminants in food and repealing Regulation (EC) No 1881/2006
2. UNI EN 16802:2016: Food Products - Determination of elements and their chemical species - Determination of inorganic arsenic in foodstuffs of marine and plant origin by anion-exchange HPLC-ICP-MS
3. Metals as contaminants in food, Panel on Contaminants in the Food Chain (CONTAM Panel), EFSA.