

Development of a method to define a maximum health level in food: cadmium and the emergent consumption of edible seaweed in France

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The consumption of edible seaweed is an emerging and growing phenomenon in Europe and France. Seaweed are a bioindicator of marine environmental quality and have a high propensity to be linked to metals due to the presence of polysaccharides in its structure. Specifically, higher levels of cadmium exceeding the French recommendation of 0.5 mg.kg⁻¹ dry matter (DM) are observed. Cadmium (Cd) is a trace element of concern found in various environmental compartments (soil, water, air) due to its natural (Earth's crust) and anthropogenic origin (industrial and agricultural activities). Cadmium is recognized to induce nephropathy, bone pathologies, cancer and disorders for the reproduction. European and French populations are overexposed to cadmium by food.

To add potentially significant cadmium intakes by an emerging consumption of seaweed can increase the exposure of consumers. The objective was to develop a methodology allowing to derive a low and protective cadmium concentration in edible seaweeds to limit cadmium overexposure in consumers.

A probabilistic approach was developed including analytical data on concentration levels of cadmium in seaweed and consumption of seaweed by French consumers, taking into account other dietary sources of exposure to cadmium. A maximum cadmium limit in edible seaweed was calculated from the approach so as not to increase the initial dietary cadmium exposure of seaweed consumers compared to oral health-based guidance value (HBGV) for cadmium. Considering that the seaweed-consuming population did not exceed the HBGV in 95% of cases, when simultaneously exposed to other dietary sources of cadmium, a cadmium concentration of 0.35 mg.kg⁻¹ DM of unprocessed seaweed (confidence interval [0.18,1.09]) has been calculated (Carne *et al.*, 2022). The new methodology revises the fixation of maximum limits in the regulatory system. It is a support to decision, especially in a context of future regulation on establishment of contaminants limits for seaweed in Europe. The approach could be applied to other relevant food / substance pairs. Taking the various sources of exposure into account, this methodology ensures better health consumer protection.

Keywords: cadmium, health limit, emergent consumption, seaweed

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Reference:

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