

Advice 01-2021 of the Scientific Committee established at the FASFC concerning action limits for some chemical contaminants in food : nickel

Background and Question

In order to provide the FASFC with a scientific basis for safeguarding the safety of the food chain, the Scientific Committee (SciCom) is asked to propose action limits for nickel in infant formulas (based on cereals or vegetables), hazelnuts, oil seeds (flax, etc.), beverages (alcoholic beverages, milk, etc.), chocolate, mussels, wheat and wheat flour and vegetables (lettuce, leeks, etc.).

Method

SciCom has established estimated acceptable concentrations (EAC) for nickel based on scientific data. An EAC is a risk-based concentration limit that corresponds to the concentration of a substance that can be present in food without exposure to the substance via food causing an appreciable risk or concern for public health. The calculated EACs can be used as a basis for the risk manager to set an action limit (SciCom opinion 15-2019).

An EAC for nickel in each foodstuff of interest is calculated by dividing the tolerable daily intake (TDI) of nickel (13 µg/kg bw/day) by the consumption data at the 95th percentile (P95) of each foodstuff considered. The EACs values are then rounded according to OECD and mathematical rules.

Results and discussion

EACs for nickel in foodstuffs of interest are shown in table here-under.

Foodstuff(s)	EAC (mg/kg)
Food for infants :	7
- cereal-based	0,3
- vegetable-based	
Nuts	9
Oilseeds (flax, etc)	8
Drinks:	
- Coffee, cocoa, tea and herbal teas	0,8
- Fruit and vegetable juices, fruit and vegetable nectars (concentrates included)	0,3
- Milk	0,3
- Alcoholic drinks	0,9
Chocolate:	
- Black chocolate	15
- Filled chocolate	11
- Milk chocolate	6
- Pralines	10
- White chocolate	11
Mussels	3
Wheat	15
Wheat flour	15

Vegetables :	
- Root and tuber vegetables (potato, beet, carrot, etc.)	1,5
- Bulb vegetables (garlic, onion, shallot, etc.)	9
- Fruiting vegetables (tomato, eggplant, cucumber, etc.)	2
- Flowering Brassica (broccoli, cabbage, etc.)	4
- Leafy vegetables (lettuce, salad, spinach, etc.)	3
- Legumes with pods (bean, peas, lens, etc.)	5
- Stems/stalks eaten as vegetables (asparagus, celery, fennel, etc.)	4

These EAC values were compared to the concentrations of nickel found in food products on the market. In comparison with the results of the INNIBEL project (study project in which more than 700 samples of foodstuffs from the Belgian market were analysed between 2017 and 2019), the EAC of nickel in milk chocolate (6 mg/kg) is lower than the maximum nickel concentration observed in chocolate (8,5 mg/kg). In addition, the EAC of nickel in pulses (5 mg/kg) is lower than the maximum concentration of nickel observed in beans (10 mg/kg). Despite the fact that high levels of nickel were observed in cocoa powder (between 2000 µg/kg at the P25 and 5430 µg/kg at the P95, data from EFSA in 2020), exceeding the EAC in cocoa beverages seems only likely for a limited number of samples (in the case of a high cocoa powder dose and the use of a cocoa powder with high levels of nickel). The origin of the cocoa beans largely determines the nickel content of the cocoa.

Conclusions

The SciCom proposes an EAC for nickel in each foodstuff of interest. However, it should be noted that they could not provide protection for people-consumers sensitive to nickel with a systemic nickel contact dermatitis.

EACs can be used as limits for action. The measures or actions, applied when these limits are exceeded, are determined by the risk manager.

Recommendation

Cocoa is responsible for the presence of a significant amount of nickel in cocoa products (chocolate, etc.). The SciCom recommends that the sector be encouraged to monitor the nickel content in cocoa beans. In addition, the significant nickel contamination content in cocoa powder should be considered in the establishment of nutritional recommendations, particularly for pregnant women, (as the foetus is particularly sensitive to nickel) and for individuals with a systemic nickel contact dermatitis.

The SciCom notes that dried fruit, peanut butter, hazelnut spreads, breakfast cereals and soy products are relevant to be analysed for their nickel content. Given that soy products and breakfast cereals would account for 14% and 11%, respectively, of the nickel intake of children aged 3-9 years, it is relevant to consider also calculating EACs for these foods.

The full text is available on this website in Dutch and French.