

Advice 22-2014 of the Scientific Committee of the FASFC on a scientific approach for recall of food contaminated by nitrates, lead, cadmium, mercury, methyl mercury, arsenic or inorganic arsenic.

The Scientific Committee was mandated to develop a scientific approach to examine the existence of a risk, where it is appropriate, to recall the food in case of contamination by nitrate, lead, cadmium, mercury, methyl mercury, arsenic or inorganic arsenic. The recall of a foodstuff is the measure aimed at preventing the consumption of a contaminated foodstuff after distribution. Recall is also used to inform the consumer about the potential risks of the consumption of the concerned foodstuff.

Initially, the toxicity was studied for each contaminant after ingestion as well for the population in general as for vulnerable groups. From a scientific point of view, the presence of a contaminant in food is potentially a direct risk to the consumer when the exposure exceeds the acute reference value. The risk was calculated on the basis of the acute reference value for each contaminant, based on published studies, and the consumption by adults and children of different foodstuffs.

The following approach was developed to evaluate the risk of consumption of contaminated food:

1. If a maximum level or action limit exists for a given contaminant in a specific food, it is checked whether this maximum level is exceeded, taking into account the measurement uncertainty. Where appropriate account shall be taken of the chemical form of arsenic and mercury.
2. In case of exceeding the maximum level or the action limit or in absence of a maximum level or action limit, the acute exposure of adult consumers and children is calculated by multiplying the measured concentration of the contaminant in the food by a high consumption value (P95 percentile) of the food. For arsenic and mercury account shall be taken of the existence of various chemical forms with different toxicity.
 - In case of arsenic, the concentration of inorganic arsenic in the food has to be determined, either with a specific chemical form analysis method (speciation method), or by applying of a conversion factor (70% for food, with the exception of fish, crustaceans and molluscs).
 - In case of mercury,
 - the concentration of inorganic mercury in the foodstuff has to be determined either with a specific chemical form analysis method (speciation method) or by applying a conversion factor (20% for fish, 50% for crustaceans and 100% for other foods).
 - the concentration of methyl mercury in the foodstuff has to be determined either with a specific chemical form analysis method (speciation method) or by applying a conversion factor (100% for fish, 80% for crustaceans and 0% for other foods).
3. The estimated acute exposure is compared to the toxicological reference values for acute effects of the contaminant:
 - For arsenic: compare the calculated exposure with the '*minimal risk level*' of iAS 5 µg/kg bw/day.
 - For cadmium: compare the calculated exposure with the toxicological reference value of 4.3 µg/kg bw/day.
 - For mercury: compare the exposure to inorganic mercury with the toxicological reference value for inorganic mercury of 7 µg/kg bw/day. For fish and seafood, compare the methyl mercury exposure with the toxicological reference value for methyl mercury of 1.3 µg/kg bw/day.
 - For lead: Calculate the MOE by dividing - for typical baby and toddler foods - the BMDL₀₁ of 0.5 µg/kg bw/day or - for other foodstuffs - the value of 6.2 µg/kg bw/day by the exposure.
 - For nitrates: compare the exposure with the provisional toxicological reference value of 15 mg/kg bw/day.

4. If the acute exposure is higher than the (provisional) toxicological reference value, the '*minimal risk level*' or the MOE for acute effects, there is a risk for human health.

The decision for recall of the contaminated food, based on this risk assessment, has to be made by the risk manager.

For arsenic and mercury, two contaminants for which different chemical forms exist with very divergent toxicity, it is recommended to use an analytical method able to differentiate the chemical form (speciation method) in order to avoid the use of conventional conversion factors which often lead to an overestimation of the risk.

The full text is available on this website in dutch and in french, respectively under the section "Wetenschappelijk Comité/Adviezen" and "Comité scientifique/Avis".