

4. Information related to other heavy metals

4.1 Health effect of zinc?

Zinc is an essential trace element found in virtually all food and potable water in the form of salts or organic complexes. The WHO opined that the derivation of a formal guideline value is not required at this time, as the level of zinc is not of health concern at levels found in drinking-water.

4.2 Health effect of nickel?

Nickel is used mainly in the production of stainless steel and nickel alloys. Food is the dominant source of nickel exposure in the non-smoking, non-occupationally exposed population. Water is generally a minor contributor to the total daily oral intake. However, where there is contamination, the nickel contribution from water may be significant.

IARC concluded that inhaled nickel compounds are carcinogenic to humans (Group 1) and that metallic nickel is possibly carcinogenic (Group 2B). However, there is a lack of evidence of a carcinogenic risk from ingestion of nickel.

4.3 Health effect of copper?

Copper is an essential nutrient for human. Copper is used to make pipes and valves, and is present in alloys and coatings. Levels of copper in running water tend to be low, whereas those in standing water samples are more variable and can be higher (above 1 mg/L).

WHO set a guideline value for copper at 2mg/L. Copper will cause acute gastrointestinal effects. Drinking water which meets WHO's guideline can prevent against acute gastrointestinal effects of copper.

4.4 Health effect of manganese?

Manganese is an essential element for humans and animals. Manganese is one of the most abundant metals in Earth's crust. WHO had not derived a formal drinking-water guideline value for manganese, as the level of manganese is not of health concern at levels found in drinking-water.

4.5 Health effect of cadmium?

Long term consumption of cadmium may cause damage to the kidneys. Early symptom is proteinuria. WHO set a guideline value for cadmium at 3 ug/L. IARC has classified cadmium and cadmium compounds in Group 1 (Carcinogenic to humans). However, there is no clear evidence of carcinogenicity by the oral route and no clear evidence for the genotoxicity of cadmium.

4.6 Health effect of chromium?

Chromium is widely distributed in Earth's crust. In general, food appears to be the major source of intake. Chromium can exist in different chemical forms. Chromium (III) is an essential nutrient for human. Whereas Chromium (VI) mainly exists as products of industrial activities. The International Agency for Research on Cancer established that Chromium (VI), when inhaled, could cause lung cancers in occupationally exposed persons but its carcinogenicity has not been established through oral route. Currently the provisional guidelines value for chromium in WHO's Guidelines for Drinking Water Quality is 50 ug/L.

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