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Opinion

of the Scientific Committee on Food

on Acute Risks Posed by Tin in Canned Foods

(adopted on 12 December 2001)

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Terms of Reference

The SCF was invited to assess the acute risks posed by tin in canned foods, with reference to the opinion of JECFA given in 2000. Any specific considerations on acceptable levels of tin in infant foods were also requested.

Acute toxicity of tin

The Committee considered the toxicity only of inorganic tin, the principal form in which tin occurs in canned foods. Organotin compounds are generally much more toxic but only occur in food from environmental contamination.

Inorganic tin salts (both stannous and stannic oxidation states) are poorly absorbed from the gastrointestinal tract and mainly excreted in the faeces. Tin salts are corrosive and the acute toxicity of inorganic tin is manifest as gastric irritation, nausea, vomiting, abdominal discomfort and diarrhoea. The symptoms appear within a short time of ingestion (0.5-3.0 hours) and resolve within 48 hours. These effects are more dependent on the concentration of tin in the foodstuff ingested rather than the intake of tin on a body weight basis. There are several case reports of gastric irritation and vomiting in humans consuming canned foods or beverages, particularly acidic fruit products packaged in unlacquered or partially lacquered tinplate cans, and containing high levels of tin. In cases where these effects have been reported, subsequent analyses have shown levels of 100-490 mg/kg in canned orange drinks and of tomato juice containing 140-400 mg/kg in canned tomato juice. However, it should be noted that the ranges cited relate to analysis of juice from the same batches as those implicated in the adverse reactions rather than the actual drinks ingested. Furthermore, the circumstances of intake (overall volume ingested and period over which consumed) were not recorded. As a consequence, the available data do not enable a precise upper limit of tin concentration not causing gastrointestinal symptoms (no effect concentration) to be determined but the Committee concurs with the JECFA conclusion that levels of 150 mg/kg in canned beverages or 250 mg/kg in other canned foods may cause gastric irritation in some individuals. There are no data to determine whether infants are more sensitive than older children and adults

Reference

WHO (2001) Safety Evaluation of certain food additives and contaminants. WHO Food Additives Series No. 46. Prepared by the fifty-fifth meeting of the Joint FAO/WHO Expert Committee on Food Additives. Pp 307-360. Geneva: World Health Organisation.