Substance Information Document

Maltol

1. Substance identity

Name	Maltol
Synonyms	3-Hydroxy-2-methyl-4H-pyran-4-one 3-Hydroxy-2-methyl-4-pyrone Larixinic acid Larixic acid Palatone Talmon Vetol
IUPAC Name	3-hydroxy-2-methylpyran-4-one
CAS	118-71-8

2. Toxicological information

Maltol exhibited low acute toxicity in rodents after oral intake (LD_{50} mg/kg bw of 550-848 in mice, 1410-2330 in rats and 1410 in guinea-pigs). In short term oral studies of maltol toxicity, NOELs in rats (6-month) and dogs (90-day) were 500 and 250 mg/kg bw per day. Similarly, mice fed on average 750 mg/kg bw per day for 21 weeks showed no evidence of toxicity compared to controls. Young adult New Zealand while male rabbits dosed with approximately 21.3 mg/kg bw 3 times per week for 8-30 weeks showed no treatment-related changes in blood chemistry, histology or loss of neurological function. Moderate irritation effects were reported to the skin of rabbits when exposed to 500 mg of maltol for 24 hours. A 3-generation study of reproductive toxicity—in which groups of male and female rats were given diets containing maltol at concentrations resulting in 100, 200 or 400 mg/kg bw per day—revealed no effect on copulation rate, mating viability index, lactation, offspring sex ratio or 21-day pup survival index. However, there are conflicting reports of maltol genotoxicity in the scientific literature. It was weakly mutagenic in Salmonella typhimurium strains TA100 and TA97 at concentrations of 1-3 and 0.1-10 mg/plate, respectively. In contrast, maltol was consistently non-mutagenic when tested at concentrations up to 10 mg/plate alone or in the presence of an activation system in other studies. Maltol induced sister chromatid exchanges at concentrations ranging from 0.1-1.5 µmol/mL in Chinese hamster ovary cells and in human lymphocytes, although it was suggested that the results were due to an indirect action of maltol and not because of direct DNA reactivity. Maltol induced micronuclei in vitro in cultured human peripheral blood lymphocytes in the presence of rat liver metabolic activation (S9-mix) via a putative clastogenic mechanism of action. Equivocal results were observed for sex-linked recessive lethal mutations in Drosophila melanogaster exposed at 6-10 mg/mL. Mice dosed with a single intraperitoneal injection of 125, 250 or 500 mg/kg bw of maltol had increased levels of micronucleated polychromatic erythrocytes compared to controls at the 2 highest doses. In contrast, a genetic toxicology study of maltol at doses of 70, 350 and 700 mg/kg bw administered to rats at time 0, 24 and 45 hours revealed no statistically significant increases in micronucleus frequency or comet tail intensity/moment compared to vehicle controls. Given that

bioanalysis data were provided to demonstrate probable adequate systemic and bone marrow exposure, the negative micronucleus result was considered reliable and, accordingly, the genotoxicity concern for maltol in food was ruled out by an EFSA Panel.

JECFA	https://inchem.org/documents/jecfa/jecmono/v56je07.pdf
FEMA	-
EFSA	Panel concluded that, for maltol in food, the concern for genotoxicity could be ruled out. https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2015.4244 The FEEDAP Panel concludes that maltol added to the feed of all animal species is safe at the normal use level of 5 mg/kg feed. https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2016.4619
ECHA – REACH dossier	https://echa.europa.eu/registration-dossier/-/registered-dossier/24008
PUBCHEM	https://pubchem.ncbi.nlm.nih.gov/compound/8369
CIR	-
OSHA	-

3. Addictiveness and attractiveness

According to SCENIHR, maltol might have addictive or attractive properties.

SCENIHR	https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_029.pdf
EMA	-
PUBMED	-