# Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment

# Statement on the potential risk to human health of turmeric and curcumin supplements: Lay summary

## Introduction

1. Turmeric is the common name for the rhizome (underground stem) of *Curcuma longa* L (Linnaeus), a perennial herb grown in tropical and subtropical regions of the world. Although turmeric has a long history of safe use in the diet, recent reports across Europe have linked the consumption of turmeric and turmeric-derived supplements to hepatitis (inflammation of the liver). Regulators in Italy and France have published assessments on the safety of turmeric and concluded that a link between the consumption of turmeric-derived supplements and liver toxicity could not be ruled out (ANSES, 2022; Daniells, 2022).

2. The Food Standards Agency (FSA) has also been monitoring incidents of hepatitis related to consumption of raw and powdered turmeric and turmeric-derived supplements. Considering these incidents, uncertainties in the makeup of raw and powdered turmeric and turmeric-derived supplements, and concerns around possible contamination, the Committee on the Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) were asked to assess the risk to human health from turmeric consumption. The COT statement includes the outcomes of the Committee's discussions on the topic and their review of the results from an FSA-funded analysis of different turmeric and turmeric-derived products available on the market (Fera, 2022).

3. In their assessment, the COT have paid particular attention to curcuminoids (namely curcumin, bisdemethoxycurcumin (BDMC) and demethoxycurcumin (DMC)) which are the key active chemical components in turmeric. Curcuminoids are present in turmeric and turmeric-derived supplements.

4. The COT noted that the two main curcuminoids present in turmeric are poorly absorbed by the body when taken by mouth. However, supplements may contain synthetic forms of curcumin, or formulations that aim to increase their absorption, which could in turn alter their potential toxicity.

5. The Committee have concluded that, despite the limited data available, there is reasonable evidence for a link between turmeric consumption and liver toxicity. This is because the adverse effects that occurred upon consumption/challenge with turmeric were reversed after consumption had stopped. The Committee concluded that the recent incidents of liver toxicity were unlikely to be caused by the presence of a contaminant (e.g. heavy metals) as levels are very low.

6. UK consumption of turmeric/curcuminoids in turmeric as a normal part of the diet (i.e. as a food additive or as a spice) generally leads to exposures that are within the dietary Acceptable Daily Intake (ADI) of 0 – 3 mg/kg body weight (FAO/WHO, 2004; EFSA, 2010). The ADI is the amount of a substance that can be consumed daily over a lifetime without a significant risk to health and has been agreed by the COT. If consumption of supplements is based on the label guidance of the products reviewed in the COT Statement, there may be minor exceedances of the dietary ADI, but these should not pose a significant risk to health. However, when turmeric/curcuminoids is/are consumed in high quantities such as for purported health benefits, or via the intake of supplements, occasional exceedances of the ADI can occur, with consequent possible risks to health.

7. Rare cases of liver damage/injury (i.e. hepatotoxicity) have been reported in people who had used turmeric supplements, including at levels below the ADI. These cases of liver damage are due to reactions that are unusual and/or unique to an individual and are related to an individual's genetic makeup. These are called "idiosyncratic" reactions which are rare, unpredictable, and not reproducible in animals. Development of These reactions can vary markedly among individuals with dose and duration of consumption of turmeric/curcumin supplements. The individual may not know

they are susceptible before taking a supplement. This possibility of an unexpected idiosyncratic response cannot be ruled out with the use of such supplements.

8. The Committee agree that any substantial exceedances of the ADI represent a potential health risk to humans, especially if other medicines are being taken at the same time, due to curcuminoid-drug interactions, and for individuals with altered function of the liver, gall bladder and/or bile ducts.

**References**

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