Substance Information Document

Vanillin

1. Substance identity

Name	Vanillin
Synonyms	Vanillaldehyde ; 4-Formyl-2-methoxyphenol
IUPAC Name	4-hydroxy-3-methoxybenzaldehyde
CAS	121-33-5

2. Toxicological information

US FDA has considered that vanillin is a respiratory irritant. It does not appear to be a dermal irritant, but it does have ocular irritation potential. A number of human population studies have shown a low prevalence for skin sensitisation and a mouse LLNA indicates that vanillin is a weak sensitiser. It displays, a moderate acute oral systemic toxicity (LD50 values of 1000-4370 mg/kg bw in a range of laboratory animals) and very low dermal systemic toxicity (rat and rabbit LD50 values of >2000 and >5010 mg/kg bw, respectively). Vanillin has produces low acute inhalation systemic toxicity (no deaths in rats exposed to saturated vapour for 4 hours).

Limited reporting suggested a NOAEC of 0.5 mg/m3, based on adverse effects at 1.5 mg/m3.

ADI of 10 mg/kg bw has been established based on oral repeated-dose toxicity study selected by JECFA (1968, 2002).

EFSA concluded that there was no concern for genotoxicity for a group of benzyl alcohol-related food flavourings, in which supporting data on vanillin were cited. The NOAEL for female reproductive and developmental toxicity in an oral rat study was 500 mg/kg bw/day (the highest dose tested). There is no concern for carcinogenicity from the limited data available.

JECFA	HYDROXY- AND ALKOXY-SUBSTITUTED BENZYL DERIVATIVES (JECFA Food Additives Series 48) (inchem.org)
FEMA	0320 FEMA GRAS 29 (femaflavor.org)
EFSA	Scientific opinion on flavouring group evaluation 414 (FGE.414): 2-hydroxy-4-methoxybenzaldehyde (wiley.com) Scientific Opinion on Flavouring Group Evaluation 20, Revision 4 (FGE.20Rev4): Benzyl alcohols, benzaldehydes, a related acetal, benzoic acids, and related esters from chemical groups 23 and 30 (wiley.com)
ECHA – REACH dossier	Registration Dossier - ECHA (europa.eu)

PUBCHEM	Vanillin | C8H8O3 - PubChem (nih.gov)
CIR	-
OSHA	VANILLIN.PDF (oecd.org)

3. Addictiveness and attractiveness

The European Commission's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR, 2016) and an EU report for the Public Information Tobacco Control (PITOC) project (DKFZ, 2012), noted that vanillin may add to the attractiveness of tobacco products through its vanilla flavour.

Vanillin is the most common flavouring ingredient added to e-liquids, reportedly providing a sweet, powerful, creamy, vanilla-like flavour. An investigation done on the Dutch marked, showed that such flavourings increase e-cigarette attractiveness and use.

Vanillin is a well-known natural compound with potential to reduce the sensitivity to pain capacity. The results of a study highlighted the anti-inflammatory and tissue repair ability of the vanillin; therefore, it shows a potential therapeutic interest as an inflammatory modulator molecule with novel application in periodontal regeneration and oral health.

SCENIHR	Addictiveness and Attractiveness of Tobacco Additives (europa.eu)
EMA	-
PUBMED	Comprehensive overview of common e-liquid ingredients and how they can be used to predict an e-liquid's flavour category - PubMed (nih.gov) Assessment of the Vanillin Anti-Inflammatory and Regenerative Potentials in Inflamed Primary Human Gingival Fibroblast - PubMed (nih.gov) Anti-Neuroinflammatory Effects of Vanillin Through the Regulation of Inflammatory Factors and NF-κB Signaling in LPS-Stimulated Microglia - PubMed (nih.gov)