Benzaldehyde

Botanical Source

Synonyms Benzene Carbaldehyde;
Benzenemethylal;
Benzoic aldehyde

IUPAC Name

CAS Reference 100-52-7

E Number

Food Legislation

Council of Europe (CoE)	
Number	Comment
101	Listed by the Council of Europe as acceptable for use in food.

US Food and Drug Administration	
Number	Comment
182.60	Approved by the US FDA. FDA 21 CFR 182.60

Joint FAO/WHO Expert Committee on Food Additives (JECFA)		
Number	ADI	Comment
22	9300	ADI 0-5.0 mg/kg bw

FEMA	
FEMA No.	Comment
2127	Generally recognised as safe as a flavour ingredient:GRAS List Number 3

Natural Occurrence and Use in Food
Found in apple juice, almond, apricot, artichoke, asparagus, beans, beef, beer; used in baked goods, chewing gum.

Estimated Intake from Food and Drink	
Daily Intake mg/kg/day	FEMA Possible Average Daily Intake mg
0.34	48.15

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Tobacco Product Related Chemical and Biological Studies for Ingredients Added in a Mixture

Smoke Chemistry		
Published Source	Level Tested %	Comment
BAT	0.03000	At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke.
Philip Morris	0.00120	An overall assessment of the data suggests that this ingredient did not add to the toxicity of smoke.

Ames Activity		
Published Source	Level Tested %	Comment
BAT	0.03000	Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke condensate was not increased by the addition of the ingredient.
Philip Morris	0.00120	Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke was not increased by the addition of the ingredient.

Micronucleus		
Published Source	Level Tested %	Comment
BAT	0.03000	Within the sensitivity of the in vitro micronucleus assay the activity of the cigarette smoke condensate was not increased by the addition of the ingredient.

Neutral Red		
Published Source	Level Tested %	Comment
BAT	0.03000	Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke condensate was not increased by the addition of the ingredient.
Philip Morris	0.00120	Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke was not increased by the addition of the ingredient.

Inhalation		
Published Source	Level Tested %	Comment
BAT	0.03000	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.
Lorillard	0.00009	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.
Philip Morris	0.00120	The data indicate that the addition of the ingredient, when added with one of three groups, did not increase the inhalation toxicity of the smoke.

Mouse Skin Painting		
Published Source	Level Tested %	Comment
Lorillard	0.00009	None of the changes appeared to be substantial enough to conclude that the tumour promotion capacity of the condensate was discernibly different between condensate produced from cigarettes with the ingredient in comparison with condensate from cigarettes without the ingredient.

References

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Tobacco Product Related Chemical and Biological Studies for Ingredients Tested Singly

References
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Toxicological Data on the Unburnt Ingredient

[+ve, positive; -ve, negative; ?, equivocal; with, with metabolic activation; without, without metabolic activation]

In vivo

Species	Test conditions	Endpoint	Result	Reference
Drosophila melanogaster	1150 ppm was dissolved in feed (5% sucrose) and treatment lasted for 3 days, or 2500 ppm was administered as a single injection. Sex-linked recessive lethal mutation test – treated males were mated with untreated females and offspring examined for effects.	Germ cell mutation.	-ve	IUCLID, 2000

In vitro

Test system	Test conditions	Endpoint	Activation	Result	References
Human lymphocytes and Chinese hamster ovary cells	Tested up to 1.6 mg/ml in hamster cells and up to 2 mmol/l in human cells. Cells examined for evidence of sister chromatid exchange.	Chromosome effects.	With and without S9 (hamster); without (human)	+ve	Feron *et al*. 1991; IUCLID, 2000; JECFA, 1997
Chinese hamster B241 and ovary cells	Tested up to 50 nmol/l in B241 cells and 1.6 mg/ml in ovary cells.	Chromosome damage [presumably aberrations].	With and without S9.	Ovary cells: -ve B241 cells: +ve	Feron *et al*. 1991; JECFA, 1997; TNO BIBRA, 1989
Chinese hamster lung cells	Chromosome aberration test. No further details given.	Chromosome damage	With and without S9.	+ve	IUCLID, 2000

Mouse lymphoma L5178Y TK +/- cells	Mutagenesis assay. No details provided.	Mutation.	With and without S9.	+ve (with S9 only).	Heck *et al*. 1989
Mouse lymphoma L5178Y cells	Mutagenesis assay. Tested up to a concentration of 0.48 mg/ml (0.64 mg/ml was lethal to cells).	Mutation.	Without.	+ve	McGregor *et al*. 1991; IUCLID, 2000
Salmonella typhimurium, strains TA98, TA100, TA1535, TA1537; *Escherichia coli*, strain WP2uvrA/pKM101	Ames test. Tested up to 5 mg/plate. (This dose was toxic.)	Mutation.	With and without S9.	-ve	JETOC, 2000
Salmonella typhimurium, strains TA97, TA98, TA100, TA1535, TA1537, TA1538, (TA2637)	Ames test. Presumably tested up to around 5 mg/plate.	Mutation.	With and without S9.	-ve	Heck *et al*. 1989; (IUCLID, 2000); Zeiger & Margolin, 2000
Salmonella typhimurium, strains TA98, TA1537, TA7001, TA7002, TA7003, TA7004, TA7005, TA7006	Ames test. Presumably tested up to 5 mg/plate.	Mutation.	With and without S9.	+ve in strain TA7005 with S9. -ve in all others.	Gee *et al*. 1998

Salmonella typhimurium, strains TA100, TA102, TA104	Ames test. Tested up to 3.3 mg/plate. (This dose was toxic.)	Mutation.	With and without S9.	-ve	Dillon *et al*. 1998
Salmonella typhimurium, strains TA98, TA100, TA102, TA104, TA1535, TA1537	Ames test. Various conditions. Tested up to 3.3 mg/plate or 30 µmol/plate.	Mutation.	With and without S9.	-ve	JECFA, 1997
Mouse/*Salmonella typhimurium*	Two mice were given ~2.1 g benzaldehyde/kg bw by stomach tube. The urine was subjected to an Ames test using *Salmonella typhimurium*.	Mutation.	Not applicable.	-ve	TNO BIBRA, 1989
Bacillus subtilis, strains H17, M45	Recombination assay. No further details given.	Chromosome effects.	With and without S9.	+ve (with S9 only)	IUCLID, 2000
Neurospora (fungus)	No details given.	Mutation.	Not specified.	-ve	TNO BIBRA, 1989

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