

Botanical Source

Synonyms CAPRYLALDEHYDE,n-OCTANAL

IUPAC Name

CAS Reference 124-13-0

E Number

Food Legislation

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

US Food and Drug Administration	
Number	Comment
172.515	Approved by the US FDA. FDA 21 CFR 172.515

Joint FAO/WHO Expert Committee on Food Additives (JECFA)		
Number	ADI	Comment
98	0-0.1	-

FEMA	
FEMA No.	Comment
2797	

Natural Occurrence and Use in Food
Found in apple, apricot, artichoke, avocado, beef, beer, blackberry, brandy, wheat bread, butter; used in frozen dairy products, beverages, baked goods, candy.

Estimated Intake From Food and Drink	
Daily Intake mg/kg/day	FEMA Possible Average Daily
Approved	0.202

Tobacco Legislation

Tobacco				
Country	Cigarettes	RYO	Cigars	Pipe
Afghanistan				
Algeria				
Argentina				
Australia				
Bahrain				
Brazil				
Burundi				
Canada				
Comoros				
Djibouti				
EEC				
Egypt				
Eritrea				
EU TPD2				
Fiji				
France	Y	Y	Y	Y
GCC (Bahrain,				
Germany	Y	Y	Y	Y
Hong Kong				
Hungary	Y	Y	Y	Y
Iceland				
Iran				
Iraq				
Jordan				
Kazakhstan				
Kuwait				
Latvia				
Libya				
Macedonia				
Madagascar				

Malaysia				
Maldives				
Mexico				
Moldova				
Montenegro				
New Zealand				
Nigeria				
Norway				
Pakistan				
Palestine				
Papua New Guinea				
Rwanda				
Samoa				
Saudi Arabia				
Serbia				
Solomon Island				
Somalia				
Somaliland				
South Sudan				
Sri Lanka				
Sweden				
Switzerland	Y	Y	Y	Y
Syria				
Tunisia				
Turkey				
UK				
United Arab				
Uzbekistan				
Vietnam				

Y=Permitted for use in tobacco products. If use is limited, the maximum permitted level is given.

Tobacco Product related Chemical and Biological Studies

Smoke Chemistry		
Published Source	Level Tested %	Comment
BAT	0.00100	At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke.
Philip Morris	0.00010	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	0.00100	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	0.00010	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	0.00100	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	0.00100	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	0.00010	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
Philip Morris	0.00010	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.
BAT	0.00100	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.

Mouse Skin Painting		
Published Source	Level Tested %	Comment

Toxicological Data on the Unburnt Ingredient

[+ve positive; -ve, negative; ? equivocal

With, with metabolic activation; without, without metabolic activation]

In vitro Studies

Species	Test Conditions	End Point	Results	Reference
Human lung.	Not specified Dose: Including 100 µmol/litre [0.0128 mg/ml].	DNA damage.	+ve.	RTECS, 2009
Salmonella typhimurium, strains TA98, TA100, TA1535, TA1537.	Bacterial reverse mutation (Ames) assay with and without S9, positive controls were used. Dose: 3 µmol/plate [0.384 mg/plate].	Mutation.	-ve	Florin et al, 1980
Bacillus subtilis, strains H17 and M45	Not specified. Dose: 16 µg/disc.	DNA damage .	-ve.	Oda et al, 1978
Chick embryo, strain white Leghorn x Rhode Island red.	Embryos (at least 50 per tested concentration, 275 in total) at the third day of development were injected suprablastodermically with 25 µl octanal in olive oil. Control embryos were treated with olive oil. The embryos were re-incubated until the 12th day of development. Daily examinations were carried out and dead embryos were examined morphologically for malformations. Dose: 1.25, 2.5, 5, 12.5, 25 µmol /embryo [0. 16, 0. 32, 0. 64, 1.6 or 3.2 mg/embryo].	Embryotoxicity; teratogenicity.	OTD 12.50 µmol/embryo (Optimal Teratogenic Dose, which produced 36.36% abnormal embryos). Abnormalities found at the OTD level were cranio-facial (1.9%), skeleton and limbs (17.3%), hypomorph and hydrops (3.8%), and miscellaneous (13.5%). Viability of embryos was unaffected by octanal except at the highest concentration tested .	Abramovici and Rachmuth-Roizman, 1983

In vivo Studies

Species	Test Conditions	End Point	Results	Reference
Human.	Octyl aldehyde (purity 95%) was applied to 20 healthy volunteers aged 26-29 years in either a closed patch test or as part of a test involving the use of a nitro-cellulose replica. The nitro-cellulose replica method was used and compared to a closed patch test. The concentration of the test compound was adjusted using petrolatum. In the nitro-cellulose replica method octyl aldehyde in petrolatum was applied to the skin as a semi-open patch test and removed after 24 hours. 30 minutes after removal visual evaluation of the site was performed and replicas of the skin (on nitrocellulose disks) were taken (n-butyl acetate was used to soften the disks) to allow for microscopic evaluation. In the closed patch test 15 µl aqueous of test compound was applied to the skin in contact for 24 hours. Dose: 0.5, 1, 2 m [7.8, 15.6, 31 %; m indicates molality, or mol/kg; density of petrolatum 0.82 g/ml].	Skin irritation.	Octyl aldehyde did produce irritation and the irritation significantly increased with increasing concentration .	Sato et al, 1996
Human.	"Standard Draize test ". Dose: 128,240 ppm [12.8%].	Skin irritation.	Mild irritation.	RTECS, 2009

Rabbit, New Zealand White.	4 hour semi-occlusive coverage of 0.5 ml aldehyde C8 to a shaved area on 3 animals. The test substance was then removed by washing. Observations continued for up to 14 days . Dose: 100%.	Skin irritation.	"Irritating." "Well-defined to moderate erythema with slight to moderate oedema developed in all three animals and was accompanied by blanching and hardening of the skin. These reactions gradually ameliorated and new skin was seen on one animal from day 12. The erythematous reactions persisted to termination in all three treated rabbits ".	ECHA
Rabbit .	0.5 ml administered . Dose: Not specified	Skin irritation.	Moderate irritation.	RTECS, 2009
Rabbit, New Zealand White	0.1 ml aldehyde C8 was administered to the eyes of 3 animals and not rinsed out. Examination of the eyes was made after 1 hour and 1, 2, 3 (equivalent to 24, 48 and 72 hours after instillation), 4, 7 and 14 days after instillation . Dos: 1	Eye irritation, overt signs of toxicity.	Corneal opacification, iridial inflammation and conjunctival irritation were observed. All reactions had resolved 7 and 14 days after instillation. There were no overt signs of toxicity in any of the animals during this study .	ECHA
Rabbit .	"Standard Draize test" 0.01 ml or 0.5 ml administered . Dose: Not specified	Eye irritation.	Mild irritation (0.1ml administered). Severe irritation (0.5 ml administered).	RTECS, 2009
Human.	"Standard repeated insult patch test" with octanal in alcohol conducted on 40 subjects . Dose: 0.25%.	Skin sensitization.	No sensitization.	Opdyke, 1973
Guinea pig, Hartley	Male guinea pigs (3 per dose) were treated intracutaneously for 7 days at a dose of 0.1 ml of 1% n-octanal/day to induce sensitization. Three weeks later n-octanal was injected intracutaneously. Control animals received 0.1 ml of saline-1% Tween 80 solution intracutaneously instead of the n-octanal solution. Reactions were read 24 hours after the challenge. Dose: 0, 0.25, 0.5, 1.0%.	Skin sensitization.	"Sensitizing": positive reactions in all animals in all test groups.	ECHA
Guinea pig .	Freund's complete adjuvant (FCA) test on 2 groups of 10-20 male and female guinea pigs. Induction: 0.1 ml of aldehyde C-8 dissolved in a 5% Freund's Complete Adjuvant solution was administered intradermally 3 times over 9 days (days 1, 5 and 9). Controls were administered FCA only. Challenge: Test compound was applied (uncovered) for 24 hours at a pre-determined non-irritating concentration on day 21 and 35. Dose: 10%.	Skin sensitization.	No allergenic response. "Not sensitizing".	ECHA
Rat .	6 albino male rats were whole body exposed to an atmosphere containing 1-octanal for up to 8 hours. Observations were continued for up to 14 days. Dose Not specified	Mortality, adverse effects.	8-hour LC50 >830,000 mg/m3 .	ECHA ; Smyth et al, 1962
Rat, Wistar.	5 non-fasted males were administered 1-octanal by oral gavage . Dose: Not specified	Mortality.	LD50 4616 mg/kg bw.	EPA ; Smyth et al, 1962
Rabbit, New Zealand White.	A clipped area on the trunk of 4 males was exposed to 1-octanal under occlusive cover. Animals were observed for 14 days . Dose: Not specified	Mortality.	LD50 5207 mg/kg bw .	EPA ; Smyth et al, 1962
Rabbit .	Not specified. Dose: Not specified	Mortality.	LD50 6350 mg/kg bw.	HSDB, 2009
Rat, Wistar	3 rats were exposed to "odorous" environments from 2 weeks of age continuously for up to 12 weeks. Animals were sacrificed at 4 and 8 weeks. Dose: 2.9 x 10-12 M .	Mitral cell degeneration in the olfactory bulb.	Exposure to octanal produced moderate to dense degeneration (in a specific pattern) of mitral cells in the olfactory bulb .	Pinching and Doving, 1974

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