GENERAL REQUIREMENTS FOR NATURAL FLAVOURINGS

CAC/GL 29-1987 [1]

1. DEFINITIONS

1.1 Natural flavourings

Natural flavourings are products used to impart flavour to a food or beverage - with the exception of only salty, sweet or acid tastes. Their aromatic part consists exclusively of "natural flavours" and/or "natural flavouring substances" and they may or may not contain adjuncts. They are not intended to be consumed as such.

1.2 Natural flavours

Natural flavours and natural flavouring substances are preparations and single substances respectively, acceptable for human consumption, obtained exclusively by physical, microbiological or enzymatic processes from material of vegetable or animal origin either in the raw state or after processing for human consumption by traditional food preparation processes (including drying, roasting and fermentation).

1.3 Adjuncts

Adjuncts are foodstuffs and food additives which are essential in the manufacture and use of "natural flavourings".

1.4 Natural aromatic raw materials

Natural aromatic raw materials are vegetable or animal raw materials suitable for use in the preparation of "natural flavours". These raw materials include foods, spices and herbs and other vegetable source [2] which are appropriate for use in the intended application.

2. FOOD ADDITIVES

Natural flavourings may contain food additives (including carriers) as far as these are necessary for the production, storage and application of the flavourings and as far as these are present in amounts which would not perform a technological function in the finished food.

3. BIOLOGICALLY ACTIVE SUBSTANCES

With the exception of quinine and quassine, the following biologically active substances should not be added as such to food and beverages. They may only be contributed through the use of natural flavourings to foods and beverages, provided that the maximum levels specified below in mg/kg of the final product ready for consumption are not exceeded.

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[1] The General Requirements for Natural Flavourings were adopted by the Codex Alimentarius Commission in 1985 by the 16th Session. They have been sent to all Member Nations and Associate Members of FAO and WHO as an advisory text, and it is for individual governments to decide what use they wish to make of them. The Commission has expressed the view that the General Requirements might provide useful checklists of requirements for national food control or enforcement authorities.

[2] For information concerning appropriate aromatic raw materials for use in foods and beverages, see list of references in Appendix A.

	Biologically active substance	Food commodity	Beverage	Exceptions
3.1	Agaric acid	20	20	100 mg/kg in alcoholic beverages and in food containing mushrooms.
3.2	Aloin	0.1	0.1	50 mg/kg in alcoholic beverages.
3.3	β-Azarone	0.1	0.1	1 mg/kg in alcoholic beverages; 1 mg/kg when seasoning used at low levels in food.
3.4	Berberine	0.1	0.1	10 mg/kg in alcoholic beverages only.
3.5	Cocaine	cocaine free by agreed test		
3.6	Coumarin	2	2	10 mg/kg in special caramels and in alcoholic beverages.
3.7	Total hydrocyanic acid (free and combined)	1	1	25 mg/kg in confectionery; 50 mg/kg in marzipan; 5 mg/kg in stone fruit juices; 1 mg/kg per % volume in alcoholic beverages.
3.8	Hypericine	0.1	0.1	1 mg/kg in pastilles (lozenges); 2 mg/kg in alcoholic beverages.
3.9	Pulegone	25	100	250 mg/kg in peppermint or mint flavoured beverages; 350 mg/kg in mint confectionery (higher levels are to be found in special strong mint).
3.10	Quassine	5	5	10 mg/kg in pastilles (lozenges); 50 mg/kg in alcoholic beverages.
3.11	Quinine	0.1	85	300 mg/kg in alcoholic beverages; 40 mg/kg in fruit curds.
3.12	Safrole	1	1	2 mg/kg in alcoholic beverages containing less than 25% vol; 5 mg/kg in alcoholic beverages above 25% vol; 15 mg/kg in food containing mace and nutmeg.
3.13	Santonin	0.1	0.1	1 mg/kg in alcoholic beverages above 25% vol.
3.14	Thujones (α and β)	0.5	0.5	10 mg/kg in alcoholic beverages above 25% vol; 5 mg/kg in alcoholic beverages containing less than25% vol; 35 mg/kg in bitters; 25 mg/kg in food containing sage; 250 mg/kg in sage stuffings.

4. HYGIENE

4.1 It is recommended that "natural flavourings" be prepared in accordance with the appropriate sections of the General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (CAC/RCP 1-1969, Rev.2 (1985))

4.2 When tested by appropriate methods of sampling and examination, the natural flavourings:

(a) should be free from micro-organisms of public health significance capable of development under normal conditions of storage of the natural flavourings of the food commodity and of the beverage; and

(b) should not contain any substances originating from micro-organisms in amounts which may represent a hazard to health.

5. METHODS OF ANALYSIS

References to methods of analysis:

5.1 General methods, recommended by IOFI:

Analytical Procedure for a General Headspace Method. Recommended Method 1 (1973*). Int. Flav. Food Add.*, **6**(2), 128 (1975).

Analytical Procedure for a General Method for Gas Chromatography. Recommended Method 4 (1974). *Int. Flav. Food Add.*, 7(2), 55-56 (1976).

Analytical Procedure for a General Method for High Pressure - (high performance) Liquid Chromatography. Recommended Method 17 (1980). *Z. Lebensm.-Unters. Forsch.***174**, 396-398 (1982).

Analytical Procedure for a General Method for Gas Chromatography on Capillary Columns. Recommended Method 18 (1980). *Z. Lebensm.-Unters. Forsch.* **174**, 399-400 (1982).

5.2 Specific methods, recommended by IOFI:

Quinine-Spectrophotometric Determination. Recommended Method 2 (1973). *Int. Flav. Food Add.*, **6**(3), 184 (1975).

Safrole and Isosafrole - Gas Chromatographic Determination. Recommended method 5 (1976). *Int. Flav. Food Add.*, **8**(1), 27 (1977).

Thujone - Gas Chromatographic Determination. Recommended Method 6 (1976). *Int. Flav. Food Add.*, **8**(1), 28(1977).

Pulegone - Gas chromatographic Determination. Recommended Method 7 (1976). *Int. Flav. Food Add.*, **8**(4), 161 (1977).

Coumarin in Certain Foods - Isolation by Extraction. Recommended Method 8 (1978). *Int. Flav. Food Add.*, **9**(5), 223(1978).

Coumarin - Gas chromatographic Determination. Recommended Method 9 (1978). *Int. Flav. Food Add.*, **9**(5), 223, 228 (1978).

Beta-Azarone - Gas chromatographic Determination. Recommended Method 10 (1978). *Int. flav. Food Add.*, **9**(5), 228 (1978).

Quassine - Gas Chromatographic Determination. Recommended Method 11 (1978). *FFIP*, **1**(1), 24 (1979).

Coumarin in Certain Foods - Isolation by Steam Distillation. Recommended Method 12 (1979) Revised version. *FFIP*, **1**(2) 93 (1979).

Hydrocyanic Acid - Photometric Determination. Recommended Method 13 (1979). *FFIP*, **1**(3), 140 (1979).

Agaric Acid - Gas chromatographic Determination. Recommended Method 14 (1979). *FFIP*, **1**(4), 193 (1979).

5.3 Specific methods, recommended by FIVS:

Détection et dosage de quatre composés (thujone, safrole, β-azarone et coumarine) dans les boissons alcooliques. P.A.P. Liddle c.s.. *Ann. Fals. Exp. Chim*. **69**, 857-864 (1976).

Dosage de l'acide agarique dans les boissons alcooliques. P.A.P. Liddle c.s. *Ann. Fals. Exp. Chim*. **72**, 125-132 (1979).

La determinazione del safrolo nelle bevande alcoliche aromatizzate, L. Ussegli-Tommaset & G. Mazza, Riv. *Viticolt. e Enol. Conegl*. **33**, 435-452 (1980).

La determinazione della cumarine nelle bevande alcoliche aromatizzate. *ibid*. **33**, 247-256 (1980).

La determinazione della cumarine mediante HPLC.G. Mazza. *ibid*. **37**, 316-323 (1984).

La determinazione del safrolo mediante HPLC. G. Mazza, Riv. *Soc. Ital. Sc. aliment*. **12**, 159-166 (1983).

Dosage de la β-azarone par HPLC. G. Mazza,. *Sciences des aliments* **4**, 233-245 (1984).

5.4 Specific methods recommended by ISO

ISO 7355-1985 Determination of safrole and *cis*- and *trans*-isosafrole in oils of sassafras and nutmeg by GLC.

ISO 7356-1986 Determination of α- and β-thujone in oils of artemisia and sage by GLC.

ISO 7357-1985 Determination of *cis*-β-azarone in oil of calamus by GLC.

APPENDIX A

REFERENCES TO LISTS OF AROMATIC RAW MATERIALS SUITABLE FOR THE PREPARATION OF NATURAL FLAVOURS [3, 4]

1. Flavouring Substances and Natural Sources of Flavourings, Council of Europe, 3rd ed. 1981.

2. International Standard ISO 676 Spices and condiments. 1st List.

3. United States of America Code of Federal Regulations (Revised as of April 1, 1986), Title 21, Parts 172.510, 182 and 184.

4. Canada, Food and Drugs Regulations Part B, Division 10.

5. AFNOR Norme Française NF V00-001.

6. Payom Tuntiwat, 1984, Creungthate, Mahidol University, Bangkok, Thailand.

7. Fenaroli's Handbook of Flavour Ingredients (Volume I) by CRC Press Inc., Cleveland, Ohio.

8. Tanaka's Cyclopedia of Edible Plants of the World by Tyôzaburô, Tanaka Keigaku Publishing co., Tokyo, 1976.

9. Reports of the Flavor and Extract Manufacturers' Association of the United States (FEMA) Expert Panel's publications on generally recognized as safe (GRAS) status:

Food Technology	19(2):	151-197, 1965
"	24(5):	25-28, 30-32 & 34, 1970
"	26(5):	35-42, 1972
"	27(1):	64-67, 1973
"	27(11):	56-57, 1973
"	28(9):	76-80, 1974
"	29(1):	70-72, 1975
"	31(1):	65-67, 70, 72 & 74, 1977
"	32(2)	60-62, 64-66, 68-70, 1978
"	33(7)	65-73, 1979
"	38(10)	70-72, 74, 76-78, 80-85 & 88-89, 1984
"	39(11)	108, 110, 112, 114 & 116-117, 1985