Publications:

EFSA CEF Panel (EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids), 2014. Scientific Opinion on Flavouring Group Evaluation 200 (FGE.200): 74 α, β-unsaturated aldehydes and precursors from subgroup 1.1.1 of FGE.19

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of 74 flavouring substances from subgroup 1.1.1 of FGE.19 in the Flavouring Group Evaluation 200 (FGE.200). The Flavour Industry has provided additional genotoxicity studies for one representative substance in FGE.200, namely hex-2(trans)-enal [FL-no 05.073], and for other two substances in the same subgroup, namely 2-dodecenal [05.037] and 2-nonenal [05.171]. The Panel has evaluated these data and concluded that the concern still remains with respect to genotoxicity for the substances of this subgroup and their three representative substances. The Panel confirms, the need for an in vivo Comet assay performed in duodenum and liver for hex-2(trans)-enal [FL-no: 05.073]. For the two other representative substances of subgroup 1.1.1 (nona-2(trans),6(cis)-dienal [FL-no: 05.058] and oct-2-enal [FL-no: 05.060]), a combined in vivo Comet assay and micronucleus assay would be required. For the latter, evidence of bone marrow exposure should be provided.

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of 13 flavouring substances in Flavouring Group Evaluation 210 (FGE.210) and one additional substance [FL-no: 07.225] in this revision 1 (FGE.210Rev1). In the first version of FGE.210 the Panel concluded that a genotoxic potential could not be ruled out for any of the 13 substances based on data available at that time. The Flavouring Industry has now submitted additional genotoxicity data. The Panel has evaluated these data and concluded that the concern for genotoxic potential is ruled out for eight of the substances [FL-no: 02.105, 07.007, 07.009, 07.011, 07.036, 07.088, 07.091 and 07.170], while for allyl alpha-ionone [FL-no: 07.061] and for alpha-damascone [FL-no: 07.134] and four structurally related substances [FL-no: 07.130, 07.225, 07.226 and 07.231] the concern still remains with respect to genotoxicity.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment
Authors: EFSA publication
Number of pages: 35
Publication date: 2014


The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of 26 flavouring substances from subgroup 2.7 of FGE.19 in the Flavouring Group Evaluation 213. In the first version of FGE.213 the Panel concluded based on available genotoxicity data that a concern regarding genotoxicity could be ruled out for [FL-no: 07.047, 07.056, 07.057, 07.075, 07.076, 07.080, 07.117, 07.118, 07.119, 07.120 and 07.168], but for the remaining 15 substances in subgroup 2.7 further genotoxicity data were required. Based on new submitted genotoxicity data, the Panel concluded in FGE.213Rev1 that the concern regarding genotoxicity could be ruled out for 13 substances in subgroup 2.7 [FL-no: 02.106, 07.008, 07.010, 07.041, 07.083, 07.089, 07.108, 07.109, 07.127, 07.136, 07.200, 07.224 and 09.305] but not for maltol [FL-no: 07.014] and maltyl isobutyrate [FL-no: 09.525].

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment
Authors: EFSA Publication
Number of pages: 46
Publication date: 2014

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of flavouring substances from subgroup 3.2 of FGE.19 in the Flavouring Group Evaluation 215 (FGE.215). The Flavour Industry has provided in vitro genotoxicity studies for the representative substances in FGE.215, namely 4-phenylbut-3-en-2-one [FL-no: 07.024] and 1-(4-methoxyphenyl)pent-1-en-3-one [FL-no: 07.030]. Based on these genotoxicity data, the Panel concluded that the genotoxicity concern could not be ruled out and in vivo genotoxicity data are requested.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment
Authors: EFSA Publication
Number of pages: 23
Publication date: 2014


The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate four flavouring substances in the Flavouring Group Evaluation 304, Revision 1 (FGE.304Rev1) using the Procedure in Commission Regulation (EC) No 1565/2000. This revision is made due to a re-evaluation of one flavouring substance N-(2-(pyridine-2-yl)ethyl)-3-p-menthanecarboxamide [FL-no: 16.118], as a 90-day dietary rat study has become available. One of the original five flavouring substances [FL-no: 16.124], for which additional data were requested, is no longer supported by the Industry for use as flavouring substance in Europe and will therefore not be considered any further in FGE.304Rev1. Therefore, FGE.304Rev1 will deal with four flavouring substances. None of the four substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses,
toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the four substances [FL-no: 16.117, 16.118, 16.123 and 16.125] do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Specifications including complete purity criteria and identity for the materials of commerce have been provided for all four candidate substances.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 35
Publication date: 2014

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 12(7)
Number: 3769
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
FGE.304rev1.pdf
DOIs:
10.2903/j.efsa.2014.3769
Links:
Source: PublicationPreSubmission
Source-ID: 97868308
Publication: Commissioned - peer-review › Report – Annual report year: 2014


The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 19 simple aliphatic sulphides and thiols evaluated by the JECFA at the 53rd meeting in 1999 and the 61st meeting in 2003. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. For nine substances [FL-no: 12.088, 12.179, 12.198, 12.212, 12.238, 12.239, 12.255, 12.257 and 12.291] considered in this FGE, the Panel concluded that they would pose “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered for the substances evaluated through the Procedure and for all nine substances, the information is adequate. Thus, the Panel concluded that nine substances [FL-no: 12.088, 12.179, 12.198, 12.212, 12.238, 12.239, 12.255, 12.257 and 12.291] do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach. For 10 candidate substances in FGE.74Rev3 [FL-no: 12.009, 12.013, 12.020, 12.023, 12.045, 12.074, 12.155, 12.169, 12.241 and 12.280] evaluated through the Procedure, the Panel concluded that additional toxicity data are required.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 62
Publication date: 2014

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 22 pyridine, pyrrole and quinoline derivatives evaluated by the JECFA (63rd meeting). The revision of this consideration is made since additional toxicity data have become available for isoquinoline [FL-no: 14.001], pyrrole [FL-no: 14.041] and 2-acetylpyrrole [FL-no: 14.047]. The toxicity data on 2-acetylpyrrole should also cover 2-propionylpyrrole [FL-no: 14.068]. Further, additional genotoxicity data on 6-methylquinoline [FL-no: 14.042] have become available. The Panel concluded that for 6-methylquinoline [FL-no: 14.042], the new genotoxicity data did not clear the concern with respect to genotoxicity in vitro and accordingly the substance is not evaluated through the Procedure. For 18 substances [FL-no: 14.001, 14.004, 14.007, 14.030, 14.038, 14.041, 14.047, 14.058, 14.059, 14.060, 14.061, 14.065, 14.066, 14.068, 14.071, 14.072 and 14.164] considered in this FGE, the Panel agrees with the JECFA conclusion, "No safety concern at estimated levels of intake as flavouring substances" based on the MSDI approach. For three substances [FL-no: 13.134, 14.045 and 14.046], additional toxicological data are still required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been evaluated, and the information is considered adequate for all the substances.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 50
Publication date: 2014

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
EFSA CEF Panel (EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids), 2014. Scientific Opinion on Flavouring Group Evaluation 82, Revision 1 (FGE.82Rev1): Consideration of Epoxides evaluated by the JECFA (65th meeting)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of five epoxides evaluated by the JECFA at the 65th meeting in 2005. This revision is made due to inclusion of one additional substance, beta-ionone epoxide [FL-no: 07.170], cleared for genotoxicity concern and due to additional toxicity data have become available for beta-caryophyllene epoxide [FL-no: 16.043]. Since publication of FGE.82 one substance epoxy oxophorone [FL-no: 16.051] is no longer supported for use as flavouring substances in Europe by Industry and will therefore not be considered any further. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. For four substances [FL-no: 16.015, 16.018, 16.040 and 16.043] the Panel agreed with the JECFA conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. For one substance [FL-no: 07.170] additional toxicity data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for four substances, the information is adequate; but for the substance [FL-no: 07.170] further information on stereoisomerism is required.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 32
Publication date: 2014

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 12(6)
Number: 3708
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
FGE.82Rev1.pdf
DOIs:
10.2903/j.efsa.2014.3708
Links:
Source: PublicationPreSubmission
Source-ID: 97868398
Publication: Commissioned - peer-review › Report – Annual report year: 2014


The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 44 simple aliphatic and aromatic sulphones and thiolanes evaluated by the JECFA at the 53rd and the 68th meeting. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. For 36 substances considered in this FGE the Panel concluded that they would pose “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. For seven substances [FL-no: 12.038, 12.085, 12.137, 12.138, 12.145, 12.252 and 12.259] the Panel decided, contrary to the JECFA that these substances could not be evaluated due to absence of a NOAEL from either one of these substances or from a structurally related substance. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for 44 substances, the information is adequate. For candidate substance 3-(methylthio)heptenal [FL-no: 12.273], which contains 5 to 7% of an
α,β-unsaturated aldehyde, 2-(E)-heptenal, with a possible genotoxic potential, the Panel cannot conclude that the material of commerce for this candidate substance is not of safety concern, until either this component is cleared with respect to a concern for genotoxicity, or this component is removed from the commercial product.

EFSA CEF Panel (EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids), 2014. Scientific Opinion on Flavouring Group Evaluation 94, Revision 2 (FGE.94Rev2): Consideration of aliphatic amines and amides evaluated in an addendum to the group of aliphatic and aromatic amines and amides evaluated by the JECFA (68th meeting)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 12 aliphatic amines and amides evaluated by the JECFA at the 68th meeting in 2007. This revision is required owing to additional toxicity data on 3-(3,4-dimethoxyphenyl)-N-[2-(3,4-dimethoxyphenyl)-ethyl]-acrylamide [FL-no: 16.090]. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern and available data on metabolism and toxicity. The Panel agrees with JECFA conclusion “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach for all substances considered in this FGE. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have been considered and for all 12 substances, the information is adequate.
EFSA CEF Penal (EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids), 2014. Scientific Opinion on Flavouring Group Evaluation 212, Revision 2 (FGE.212Rev2): α,β-Unsaturated alicyclic ketones and precursors from chemical subgroup 2.6 of FGE.19

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of 24 flavouring substances from subgroup 2.6 of FGE.19 in the Flavouring Group Evaluation 212, Revision 2. The Panel concluded in FGE.212, that the genotoxic potential could be ruled out for d-carvone [FL-no: 07.146] together with the structurally related l-carvone [FL-no: 07.147] as well as carveol and the carvyol derivatives [FL-no: 02.062, 09.143, 09.215 and 09.870]. Based on available genotoxicity data and new submitted genotoxicity data from the Industry, the Panel concluded that the genotoxic potential could be ruled out for the 11 isophorone derivatives [FL-no: 02.083, 02.101, 07.035, 07.098, 07.126, 07.129, 07.172, 07.175, 07.196, 07.202 and 07.255] and the two vetiveryl derivatives [FL-no: 02.214 and 09.821] in FGE.212Rev1 and FGE.212Rev2, respectively. For the remaining five substances [FL-no: 07.033, 07.094, 07.112, 07.140 and 07.219] from subgroup 2.6 there is still a genotoxicity concern and additional data are required.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment
Authors: EFSA Publication, Beltoft, V. M. (Intern), Binderup, M. (Intern), Nørby, K. K. (Intern)
Number of pages: 43
Publication date: 2014

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 12(2)
Number: 3584
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
FGE.212rev2.pdf
DOIs:
10.2903/j.efsa.2014.3584
Links:
Source: PublicationPreSubmission
Source-ID: 92351110
Publication: Commissioned - peer-review › Report – Annual report year: 2014

Scientific Opinion on Flavouring Group Evaluation 401 (FGE.401): γ-Glutamyl-valyl-glycine from chemical group 34

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to carry out a safety assessment of one flavouring substance, γ-glutamyl-valyl-glycine [FL-no: 17.038], in the Flavouring Group Evaluation 401 (FGE.401), in accordance with the Commission Regulation (EC) No 1331/2008. There is no safety concern with respect to genotoxicity for the flavouring substance. It has been demonstrated that the flavouring substance, which is a tripeptide, will be hydrolysed to the three amino acids L-glutamic acid, L-valine and glycine. As the human consumption of these three endogenous amino acids through food is orders of magnitude higher than the anticipated levels of exposure from their use as flavouring substances, the Panel concluded that γ-glutamyl-valyl-glycine [FL-no: 17.038] would be of no safety concern at its estimated level of intake as flavouring substance. The specifications for γ-glutamyl-valyl-glycine [FL-no: 17.038] are considered adequate according to Commission Regulation (EC) no 1334/2008.
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 12 flavouring substances in Flavouring Group Evaluation 12, Revision 4 (FGE.12Rev4), including two additional substances, using the Procedure in Commission Regulation (EC) No 1565/2000. The present revision includes two additional flavouring substances: 12-beta-santalen-14-ol [FL-no: 02.216] and 12-alpha-santalen-14-ol [FL-no: 02.217]. None of the substances was considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure–activity relationships, intake from current uses and the toxicological threshold of concern and available data on metabolism and toxicity. The Panel concluded that none of the 12 substances [FL-nos: 02.134, 02.186, 02.216, 02.217, 05.157, 05.182, 05.183, 05.198, 08.135, 09.342, 09.670 and 09.829] gives rise to safety concerns at their levels of dietary intake, estimated on the basis of the maximised survey-derived daily intake approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Specifications including complete purity criteria and identity for the materials of commerce have been provided for all 12 candidate substances.
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of five flavouring substances from subgroup 3.3 of FGE.19. In the Flavouring Group Evaluation 216 (FGE.216) additional genotoxicity data were requested. Additional genotoxicity studies have now been provided for the representative substance 2-phenylcrotonaldehyde [FL-no: 05.062]. Based on these new data the Panel concluded that the concern for genotoxicity could not be ruled out and requests a proof of sufficient systemic exposure of animals treated with 2-phenylcrotonaldehyde. Moreover, since the substance was genotoxic only without metabolic activation, it appears necessary to prove the absence of genotoxic effect locally in the gastro intestinal system using the Comet assay.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment
Authors: EFSA publication
Number of pages: 20
Publication date: 2013

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Volume: 11(7)
Number: 3305
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
3305.pdf
DOIs:
10.2903/j.efsa.2013.3305
Links:
Publication: Commissioned - peer-review › Report – Annual report year: 2013

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of 12 flavouring substances from subgroup 4.1 of FGE.19 in the Flavouring Group Evaluation 217 (FGE.217). In FGE.217, 6-methylcoumarin [FL-no: 13.012] was not considered genotoxic and was therefore evaluated through the Procedure in FGE.80Rev1. For the remaining 11 substances, the Panel concluded that based on the data available, a genotoxic potential could not be excluded and accordingly they could not be evaluated through the Procedure. Additional data on genotoxicity for the three representative substances, 5-ethyl-3-hydroxy-4-methylfururan-2(5H)-one [FL-no: 10.023], 3,4-dimethyl-5-pentylideneururan-2(5H)-one [FL-no: 10.042] and furan-2(5H)-one [FL-no: 10.066], have now been provided. Based on the new data, the Panel concluded that 5-ethyl-3-hydroxy-4-methylfururan-2(5H)-one [FL-no: 10.023] does not give rise to concern with respect to genotoxicity and can accordingly, together with the structurally related substance, 3-hydroxy-4,5-dimethylfuran-2(5H)-one [FL-no: 10.030] for which it is a representative, be evaluated using the Procedure. For 3,4-dimethyl-5-pentylideneururan-2(5H)-one [FL-no: 10.042] and furan-2(5H)-one [FL-no: 10.066] the concern for genotoxicity could not be ruled out and a combined micronucleus and Comet assay is requested for these two substances, covering the remaining seven substances [FL-no: 10.034, 10.036, 10.043, 10.046, 10.054, 10.057 and 10.060].

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 59 flavouring substances in the Flavouring Group Evaluation 21, Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. This revision is made due to the inclusion of the assessment of new toxicity data on one supporting substance 5,6-dihydro-2,4,6-tris(2-methylpropyl)-4H-1,3,5-dithiazine [FL-no: 15.113], which is considered to be structurally related to the candidate substances 2-butyl-4-methyl(4H)pyrrolidino[1,2d]-1,3,5-dithiazine [FL-no: 15.042], dihydro-2,4,6,triethyl-1,3,5(4H)-dithiazine [FL-no: 15.054], 2,4-dimethyl(4H)pyrrolidino[1,2e]-1,3,5-dithiazine [FL-no: 15.055], 4,6-dimethyl-2-(1-methylethyl)dihydro-1,3,5-dithiazine [FL-no: 15.057], 2-isobutylidihydro-4,6-dimethyl-1,3,5-dithiazine [FL-no: 15.079] and ethyl thialdine [FL-no: 15.135]. Furthermore, new in vitro genotoxicity studies have become available on the supporting substance 2-acetyl-2-thiazoline [FL-no: 15.010], which is considered to be structurally related to and a supportive substance for 2-methyl-2-thiazoline [FL-no: 15.086]. Eighteen of the original 59 candidate substances [FL-no: 15.037, 15.042, 15.043, 15.064, 15.070, 15.072, 15.077, 15.088, 15.090, 15.091, 15.092, 15.094, 15.099, 15.106, 15.107, 15.114, 15.129 and 15.133], for which additional data were requested, are no longer supported by Industry for use as flavouring substances in Europe and will therefore not be considered any further. Therefore, FGE.21Rev4 will only deal with 41 candidate substances. Two of the substances, 3-thiazolines, 2,4-dimethyl-3-thiazoline [FL-no: 15.060] and 2-isobutyl-3-thiazoline [FL-no: 15.119], were considered to have genotoxic potential. The remaining 39 substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 32 flavouring substances [FL-no: 15.038, 15.039, 15.044, 15.050, 15.051, 15.052, 15.054, 15.055, 15.057, 15.058, 15.061, 15.062, 15.063, 15.067, 15.068, 15.069, 15.071, 15.078, 15.079, 15.080, 15.082, 15.084, 15.085, 15.086, 15.087, 15.089, 15.098, 15.108, 15.115, 15.116, 15.118 and 15.135] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining seven candidate substances [FL-no: 15.040, 15.045, 15.047, 15.076, 15.093, 15.096 and 15.097] evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Adequate specifications including complete purity criteria and identity for the materials of commerce have been provided for all 41 candidate substances.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 96
Publication date: 2013


The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 59 flavouring substances in the Flavouring Group Evaluation 21, Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. This revision is made due to the inclusion of the assessment of new toxicity data on one supporting substance 5,6-dihydro-2,4,6-tris(2-methylpropyl)-4H-1,3,5-dithiazine [FL-no: 15.113], which is considered to be structurally related to the candidate substances 2-butyl-4-methyl(4H)pyrrolidino[1,2d]-1,3,5-dithiazine [FL-no: 15.042], dihydro-2,4,6,triethyl-1,3,5(4H)-dithiazine [FL-no: 15.054], 2,4-dimethyl(4H)pyrrolidino[1,2e]-1,3,5-dithiazine [FL-no: 15.055], 4,6-dimethyl-2-(1-methylethyl)dihydro-1,3,5-dithiazine [FL-no: 15.057], 2-isobutylidihydro-4,6-dimethyl-1,3,5-dithiazine [FL-no: 15.079] and ethyl thialdine [FL-no: 15.135]. Furthermore, new in vitro genotoxicity studies have become available on the supporting substance 2-acetyl-2-thiazoline [FL-no: 15.010], which is considered to be structurally related to and a supportive substance for 2-methyl-2-thiazoline [FL-no: 15.086]. Eighteen of the original 59 candidate substances [FL-no: 15.037, 15.042, 15.043, 15.064, 15.070, 15.072, 15.077, 15.088, 15.090, 15.091, 15.092, 15.094, 15.099, 15.106, 15.107, 15.114, 15.129 and 15.133], for which additional data were requested, are no longer supported by Industry for use as flavouring substances in Europe and will therefore not be considered any further. Therefore, FGE.21Rev4 will only deal with 41 candidate substances. Two of the substances, 3-thiazolines, 2,4-dimethyl-3-thiazoline [FL-no: 15.060] and 2-isobutyl-3-thiazoline [FL-no: 15.119], were considered to have genotoxic potential. The remaining 39 substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 32 flavouring substances [FL-no: 15.038, 15.039, 15.044, 15.050, 15.051, 15.052, 15.054, 15.055, 15.057, 15.058, 15.061, 15.062, 15.063, 15.067, 15.068, 15.069, 15.071, 15.078, 15.079, 15.080, 15.082, 15.084, 15.085, 15.086, 15.087, 15.089, 15.098, 15.108, 15.115, 15.116, 15.118 and 15.135] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining seven candidate substances [FL-no: 15.040, 15.045, 15.047, 15.076, 15.093, 15.096 and 15.097] evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Adequate specifications including complete purity criteria and identity for the materials of commerce have been provided for all 41 candidate substances.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 96
Publication date: 2013

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of 10 flavouring substances from subgroup 4.4 of FGE.19 in the Flavouring Group Evaluation 220 (FGE.220). FGE.220 is subdivided into two subgroups (subgroup 4.4a containing [FL-no: 13.089, 13.117, 13.119, 13.157 and 13.175] and subgroup 4.4b containing [13.010, 13.084 and 13.085, 13.099 and 13.176]). For both subgroups the Panel concluded that the genotoxicity alert could not be ruled out based on the data available and accordingly additional genotoxicity data were requested. In FGE.220, Revision 1, the Panel concluded, based on new submitted data, that for the substances in subgroup 4.4b there is no concern for genotoxicity. The Flavour Industry has now provided additional genotoxicity studies for two representative substances of subgroup 4.4a, 2,5-dimethylfuran-3(2H)-one [FL-no: 13.119] and 4-acetyl-2,5-dimethylfuran-3(2H)-one [FL-no: 13.175]. Based on the new data the Panel concluded that 2,5-dimethylfuran-3(2H)-one [FL-no: 13.119] does not give rise to concern with respect to genotoxicity. For 4-acetyl-2,5-dimethylfuran-3(2H)-one [FL-no: 13.175] the concern for genotoxicity could not be ruled out and therefore the Panel requests a repetition of the submitted micronucleus study in the presence of S9-mix applying the same conditions and possibly in addition modified conditions, or a combined in vivo micronucleus and Comet assay, including analysis of liver. This is also applicable to 2,5-dimethyl-4-methoxyfuran-3(2H)-one [FL-no:13.089] and 2,5-dimethyl-4-ethoxyfuran-3(2H)-one [FL-no:13.117], which are covered by the representative substance 4-acetyl-2,5-dimethylfuran-3(2H)-one [FL-no:13.175]. The Flavour Industry has informed that 5-methylfuran-3(2H)-one [FL-no: 13.157] is not in common use in the flavour industry and is no longer supported.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment
Authors: EFSA publication
Number of pages: 30
Publication date: 2013

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 11(10)
Number: 3390
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
3390.pdf
DOIs:
10.2903/j.efsajournal.2013.3390
Links:
Publication: Commissioned - peer-review › Report – Annual report year: 2013


The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 24 flavouring substances in the Flavouring Group Evaluation 24, Revision 2, using the Procedure in Commission Regulation (EC) No 1565/2000. This revision was made required owing to the inclusion of the assessment of new toxicity data on one supporting substance, 2-acetylpyrrole [FL-no: 14.047], to support the re-evaluation
of one candidate substance, 2-acetyl-5-methylpyrrole [FL-no: 14.085]. Nine of the original 33 candidate substances [FL-
no: 13.100, 14.002, 14.023, 14.094, 14.107, 14.138, 14.145, 14.163 and 14.169], for which additional data were
requested, are no longer supported by Industry for use as flavouring substances in Europe and will therefore not be
considered any further. None of the 24 substances were considered to have genotoxic potential. These candidate
substances were evaluated through a stepwise approach that integrates information on the structure-activity relationships,
take from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel
14.150] do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach.
Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also
been considered. Adequate specifications including complete purity criteria and identity for the materials of commerce
have been provided for all 24 candidate substances.

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 17 alicyclic primary alcohols, aldehydes, acids and related esters and one phenethyl ester evaluated by the JECFA at the 59th meeting in 2002. This revision is made due to consideration of two additional substances, santalyl acetate [FL-no: 09.034] and santalyl phenylacetate [FL-no: 09.712], cleared for genotoxicity concern in FGE.207. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for all 18 substances [FL-no: 02.114, 02.141, 05.098, 05.104, 05.112, 05.119, 05.123, 08.034, 08.060, 08.067, 09.028, 09.034, 09.289, 09.488, 09.534, 09.536, 09.615 and 09.712], considered in this FGE and agrees with the JECFA conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for all 18 substances, the information is adequate.
EFSA CEF Panel (EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids), 2013. Scientific Opinion on Flavouring Group Evaluation 76, Revision 1 (FGE.76Rev1)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present opinion concerns a group of 26 sulphur-containing heterocyclic compounds evaluated by the JECFA at the 59th meeting in 2008. This revision is made due to the inclusion of one additional substance, 5-methyl-2-thiophenecarbaldehyde [FL-no: 15.004], cleared for genotoxicity concern in FGE.224. Additionally, new toxicity data have become available for 5,6-dihydro-2,4,6-tris(2-methylpropyl)-4H-1,3,5-dithiazine [FL-no: 15.113]. Since publication of FGE.76, one substance, thiazole [FL-no: 15.028], is no longer supported by industry for use as a flavouring substance in Europe and will therefore not be considered any further. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for 21, [FL-no: 15.001, 15.002, 15.004, 15.008, 15.011, 15.013, 15.014, 15.015, 15.016, 15.017, 15.019, 15.020, 15.021, 15.022, 15.026, 15.027, 15.033, 15.035, 15.109, 15.113 and 16.027], of the 26 substances considered in this FGE and agrees with the JECFA conclusion, "No safety concern at estimated levels of intake as flavouring substances" based on the MSDI approach. For five substances [FL-no: 15.005, 15.018, 15.029, 15.030 and 15.032], the Panel could not conclude on their safety when used as flavouring substances, as these substances could not be evaluated because of concern with respect to genotoxicity. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for all 26 substances, the information is adequate.

EFSA CEF Panel (EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids), 2013. Scientific Opinion on Flavouring Group Evaluation 93, Revision 1 (FGE.93Rev1)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of five sulphur-containing heterocyclic compounds [FL-no: 15.010, 15.126, 15.128, 15.130 and 15.131] evaluated by the JECFA at its 68th meeting in 2007. This revision is required owing to additional available genotoxicity data on 2-acetyl-2-thiazoline [FL-no: 15.010]. Since the publication of FGE.93, the substance [FL-no: FL-no: 15.127] is no longer supported by Industry for use as a flavouring substance in Europe and will therefore not be considered any further. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The two substances 5-ethyl-4-methyl-2-(2-methylpropyl)-thiazoline [FL-no: 15.130] and 5-ethyl-4-methyl-2-(2-butyl)-thiazoline [FL-no: 15.131], which are 3-thiazolines, are structural similar to two other 3-thiazolines in FGE.21Rev1 for which the Panel has expressed a genotoxicity concern, and accordingly the Procedure should not be applied to these two substances until adequate genotoxicity data become available. The Panel agrees with the application of the Procedure as performed by the JECFA for the remaining three substances, 2-acetyl-2-thiazoline [FL-no: 15.010], 3-(methylthio)-methylthiophene [FL-no: 15.126] and 2-propionyl-2-thiazoline [FL-no: 15.128], of the five substances considered in this FGE and agrees with the JECFA
conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for all five substances, the information is adequate.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion Flavouring Group Evaluation 23, Revision 4 (FGE.23Rev4): Aliphatic, alicyclic and aromatic ethers including anisole derivatives from chemical groups 15, 16, 22, 26 and 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 21 flavouring substances in the Flavouring Group Evaluation 23, Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. This revision is made due to the inclusion of one additional flavouring substance, 2S-cis-tetrahydro-4-methyl-2-(2-methyl-1-propenyl)-2H-pyran [FL-no: 13.170]. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that all 21 substances [FL-no: 02.247, 02.248, 03.008, 03.011, 03.012, 03.015, 03.016, 03.020, 03.022, 03.024, 04.059, 04.067, 04.068, 04.069, 04.075, 04.079, 04.084, 08.127, 09.687, 13.170 and 13.200] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Specifications including complete purity criteria and identity for the materials of commerce have been provided for all 21 candidate substances.

© European Food Safety Authority, 2013

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 77
Publication date: 2013

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 11(2)
Number: 3092
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
FGE.23rev4.pdf
DOIs:
10.2903/j.efsa.2013.3092
Links:
Source: dtu
Source-ID: u::7818
Publication: Commissioned - peer-review › Report – Annual report year: 2013

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 06, Revision 4 (FGE.06Rev4): Straight - and branched - chain aliphatic unsaturated primary alcohols, aldehydes, carboxylic acids and esters from chemical groups 1, 3 and 4

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 56 flavouring substances in the Flavouring Group Evaluation 6, Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. This revision is made due to the inclusion of six additional flavouring substances, (-)-3,7-dimethyl-6-octen-1-ol [FL-no: 02.229], dec-4(cis)-enal [FL-no: 05.137], neral [FL-no: 05.170], trans-3,7-dimethylocta-2,6-dienal (geranial) [FL-no: 05.188], trans-3-hexenyl formate [FL-no: 09.562] and cis-3-hexenyl 2-methylbutanoate [FL-no: 09.854]. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern and available data on metabolism and toxicity. The Panel concluded that the 56 substances [FL-no: 02.125, 02.138, 02.152, 02.170, 02.175, 02.176, 02.195, 02.201, 02.222,
do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Adequate specifications including complete purity criteria and identity for the materials of commerce have been provided for all 56 candidate substances.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 224 (FGE.224): Consideration of genotoxic potential for two α,β - unsaturated thiophenes from subgroup 5.2 of FGE.19 by EFSA.

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of two flavouring substances from subgroup 5.2 of FGE.19 in the Flavouring Group Evaluation 224 (FGE.224). The Flavour Industry has provided additional genotoxicity studies for one of the two substances in FGE.224, namely 5-methyl-2-thiophenecarbaldehyde [FL-no: 15.004]. The data requested by EFSA for the other substance, 3-acetyl-2,5-dimethylthiophene [FL-no: 15.024] of FGE.224 will be provided subsequently according to the Flavour Industry. Based on the new data the Panel concluded that 5-methyl-2-thiophenecarbaldehyde does not give rise to concern with respect to genotoxicity and can accordingly be evaluated using the Procedure. For the other substance in subgroup 5.2, 3-acetyl-2,5-dimethylthiophene, the requested genotoxicity data are still pending and no conclusion could be drawn in the present FGE.

© European Food Safety Authority, 2013

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment
Authors: EFSA group
Number of pages: 18
Publication date: 2013

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 11(2)
Number: 3093
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
3093.pdf
DOI:
10.2903/j.efsa.2013.3093
Links:
Publication: Commissioned - peer-review › Report – Annual report year: 2013

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 305 (FGE.305): L - Methionylglycine of chemical group 34
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate one flavouring substance, the dipeptide L-methionylglycine [FL-no: 17.037], in the Flavouring Group Evaluation 305, using the Procedure in Commission Regulation (EC) No 1565/2000. The substance was considered not to have genotoxic potential. The substance was evaluated through a stepwise approach (the Procedure) that integrates information on the structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that for the flavouring substance, evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. The present evaluation of the candidate substance L-methionylglycine [FL-no: 17.037] is only applicable for its use in foods that are not heated or
intended to be heated. Besides the safety assessment of the flavouring substance, the specifications for the material of commerce have also been considered. Adequate specifications including complete purity criteria and identity for the material of commerce have been provided for the candidate substance.

© European Food Safety Authority, 2013

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 31
Publication date: 2013

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Volume: 11(4)
Number: 3051
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
3150
DOIs:
10.2903/j.efsa.2013.3150
Links:
Publication: Commissioned - peer-review › Report – Annual report year: 2013

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 63, Revision 2 (FGE.63Rev2): Consideration of aliphatic secondary alcohols, ketones and related esters evaluated by JECFA (59th and 69th meetings) structurally related to saturated and unsaturated aliphatic secondary alcohols, ketones and esters of secondary alcohols and saturated linear or branched - chain carboxylic acids evaluated by EFSA in FGE.07 Rev4
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 20 aliphatic secondary alcohols, ketones and related esters evaluated by the JECFA at the 59th and 69th meetings in 2002 and 2008. This revision is made due to inclusion of one additional substance, 4-methylpent-3-en-2-one [FL-no: 07.101], cleared for genotoxicity concern. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for all 20 substances considered in this FGE and agrees with the JECFA conclusion, "No safety concern at estimated levels of intake as flavouring substances" based on the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for all 20 substances, the information is adequate.

© European Food Safety Authority, 2013

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 45
Publication date: 2013

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
EFSA EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 304 (FGE.304): Five carboxamides from chemical group 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate five flavouring substances in the Flavouring Group Evaluation 304, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity.

The Panel concluded that the three substances [FL-no: 16.117, 16.123 and 16.125] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining two candidate substances [FL-no: 16.118 and 16.124], no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered.

Specifications including complete purity criteria and identity for the materials of commerce have been provided for all five candidate substances.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 31
Publication date: 2012

Publication Information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(10)
Number: 2903
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
24.pdf
DOIs:
10.2903/j.efsajour.2012.2903
Links:
http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA EFSA; Scientific Opinion on Flavouring Group Evaluation 99 (FGE.99): Consideration of furanone derivatives evaluated by the JECFA (63rd, 65th and 69th meetings)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of five furanone derivatives evaluated by the JECFA at their 63rd, 65th and 69th meetings. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for one of the five substances [FL-no: 13.010]. Contrary to the JECFA the Panel allocate three substances [FL-no: 13.084, 13.085 and 13.099] to structural class III due to lack of information on natural occurrence. With regards to the substance [FL-no: 13.176] for which the JECFA concluded that the Procedure for the Safety Evaluation of Flavouring Agents could not be applied because of the unresolved toxicological concerns relating to the epoxidation and
opening of the furan ring, the Panel concluded that adequate NOAELs exist and accordingly concluded, “No safety concern at the estimated level of intake”. Therefore, the Panel concluded that all five substances do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for all five substances, the information is adequate.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 30
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(10)
Number: 2901
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
23.pdf
DOIs:
10.2901/j.efsa.2012.2901
Links:
http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Material, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 201Rev1: 2-Alkylated, aliphatic, acyclic alpha,beta-unsaturated aldehydes and precursors, with or without additional double-bonds, from chemical subgroup 1.1.2 of FGE.19
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider in this revision 1 of Flavouring Group Evaluation 201, the additional data on genotoxicity submitted by the Industry on two substances, 2-methylpent-2-enal [FL-no: 05.090] and 2-methylcrotonaldehyde [FL-no: 05.095], from subgroup 1.1.2 of FGE.19. First the Panel concluded that genotoxicity data on [FL-no: 05.095] can be representative for the substances [FL-no: 02.174, 05.033, 05.090, 05.105, 05.107 and 05.126], but not for [FL-no: 05.130, 05.178, 09.177 and 09.931], for which it was concluded in the previous version of this FGE that the available data were insufficient to evaluate their genotoxicity. Secondly, the Panel considers that the mutagenicity hazard could not be cleared by the endpoints evaluated in the in vivo micronucleus assay submitted. The Panel therefore concluded that further data are required in order to clarify the genotoxic potential of this subgroup. The Panel considers the Comet assay with [FL-no: 05.095] as test material and performed on liver, blood and first site of contact, as a preferred option to further investigate the genotoxicity in vivo.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 28
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(5)
Number: 2749
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
4.pdf
EFSA Panel on Food Contact Material, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 222: Consideration of genotoxicity data on representatives for alpha,beta-unsaturated furyl derivatives with the α,β-unsaturation in the side chain from subgroup 4.6 of FGE.19 by EFSA

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of six flavouring substances from subgroup 4.6 of FGE.19 in the Flavouring Group Evaluation 222. The Flavour Industry have provided additional genotoxicity studies for two representative substances, 3-(2-furyl)acrylaldehyde [FL-no: 13.034] and 4-(2-furyl)but-3-en-2-one [FL-no: 13.044], in FGE.222. Based on these new data the Panel could not rule out a clastogenic and aneugenic potential for the two substances and an in vivo Comet assay was requested for both substances, the one including a micronucleus assay.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 18
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Volume: 10(5)
Number: 2748
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
5.pdf
DOIs: 10.2903/j.efsa.2012.2749
Links: http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Material, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 47, Revision 1: Bi- and tricyclic secondary, ketones and related esters from chemical groups 7 and 8

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate six flavouring substances in the Flavouring Group Evaluation 47, including an additional two substances in this Revision 1, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the six substances [FL-no: 02.119, 07.171, 07.196, 09.584, 09.848 and 09.888] do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Adequate specifications including complete purity criteria and identity of the materials of commerce have been provided for all six candidate substances.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 43
Publication date: 2012

Publication information
EFSA Panel on Food Contact Material, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 51, Revision 1: Consideration of alicyclic ketones and secondary alcohols and related esters evaluated by the JECFA (59th meeting) structurally related to alicyclic ketones secondary alcohols and related esters in FGE.09Rev3 (2011)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 20 alicyclic ketones and secondary alcohols and related esters evaluated by JECFA (59th meeting) in 2002. This revision is made due to inclusion of seven additional substances cleared for genotoxicity concern compared to the previous version. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for all 20 substances considered in this FGE and agrees with the JECFA conclusion, "No safety concern at estimated levels of intake as flavouring substances" based on the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for all 20 substances, the information is adequate.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 52
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(4)
Number: 2636
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
6.pdf
DOIs:
10.2903/j.efsa.2012.2636
Links:
http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Material, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 73, Revision 1: Consideration of alicyclic primary alcohols, aldehydes, acids and related esters evaluated by JECFA (59th meeting) structurally related to primary saturated or unsaturated alicyclic alcohol, aldehyde, and esters evaluated by EFSA in FGE.12Rev2 (2011)
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 16 alicyclic primary alcohols, aldehydes, acids and related esters evaluated by the JECFA at the 59th meeting in 2002. The revision is made due to consideration of one additional substance compared to the previous version. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for all 16 substances [FL-no: 02.114, 02.141, 05.098, 05.104, 05.112, 05.119, 05.123, 08.034, 08.060, 08.067, 09.028, 09.289, 09.488, 09.534, 09.536 and 09.815], considered in this FGE and agrees with the JECFA conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for all 16 substances, the information is adequate.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 26
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(3)
Number: 2638
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
1.pdf
DOIs: 10.2903/j.efsa.2012.2638
Links: http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 08, Revision 4 (FGE.08Rev4): Aliphatic and alicyclic mono-, di-, tri-, and polysulphides with or without additional oxygenated functional groups from chemical groups 20 and 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 80 flavouring substances in the Flavouring Group Evaluation 08, Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. Since the publication of the last revision of this FGE, the EFSA has been requested to evaluate 10 additional substances, which have been included in the present revision of FGE.08. For the substances methyl methanethiosulphonate [FL-no: 12.159], 2-methylbutane-2-thiol [FL-no: 12.172], 2-methylpropane-2-thiol [FL-no: 12.174], ethyl 2-mercapto-2-methyl propanoate [FL-no: 12.304] and 2,4,4-trimethyl-1,3-oxathiane [FL-no: 16.057] there is an indication of a genotoxic potential in vitro. Therefore, in the absence of further genotoxicity data, the Panel concluded that the Procedure could not be applied to these five substances. For four substances, 3-mercaptopoctanal [FL-no: 12.268], 3-mercaptodecanal [FL-no: 12.269], methanedithiol diacetate [FL-no: 12.271] and 3,5-dimethyl-1,2-dithiolane-4-one [FLno: 12.295] no data on use as flavouring substances in Europe are available. Therefore, no intakes in Europe can be estimated and accordingly the Panel concluded that the Procedure could not be applied to these four substances either. The remaining 71 substances were evaluated through a stepwise approach that integrates information on the structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 57 substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining fourteen substances [FL-no: 12.093, 12.094, 12.097, 12.100, 12.112, 12.116, 12.120, 12.164, 12.167, 12.199, 15.007, 15.102 and 15.125 and 15.134], evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of the flavouring substances, the specifications for the materials of commerce have also been considered and for 21 substances, evaluated through the Procedure, information on the stereoisomeric/positional composition and/or the specifications is lacking.

General information
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 08, Revision 5 (FGE.08Rev5): Aliphatic and alicyclic mono-, di-, tri-, and polysulphides with or without additional oxygenated functional groups from chemical groups 20 and 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 80 flavouring substances in the Flavouring Group Evaluation 08, Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. Since the publication of the last revision of this FGE, the EFSA has been requested to evaluate additional toxicological data submitted for two flavouring substances, one on supporting substance 2,5-dihydroxy-2,5-dimethyl-1,4-dithiane [FL-no: 15.006], which support the evaluation of the candidate substance 2,5-dihydroxy-1,4-dithiane [FL-no: 15.134] and one on the candidate substance spiro(2,4-dithia-1-methyl-8-oxabicyclo[3.3.0]octane-3,3’-(1’-oxa-2’-methyl)-cyclopentane) and spiro(2,4-dithia-6-methyl-7-oxabicyclo[3.3.0]octane-3,3’-(1’-oxa-2’-methyl)-cyclopentane) [FL-no: 15.007], which have been included in the present revision of FGE.08. For the substances methyl methanethiosulphonate [FL-no: 12.159], 2-methylbutane-2-thiol [FL-no: 12.172], 2-methylpropane-2-thiol [FL-no: 12.174], ethyl-2-mercapto-2-methyl propanoate [FL-no: 12.304] and 2,4,4-trimethyl-1,3-oxathiane [FL-no: 16.057] there is an indication of a genotoxic potential in vitro. Therefore, in the absence of further genotoxicity data, the Panel concluded that the Procedure could not be applied to these five substances. For four substances, 3-mercaptooctanal [FL-no: 12.268], 3-mercaptodecanal [FL-no: 12.269], methanedithiol diacetate [FL-no: 12.271] and 3,5-dimethyl-1,2-dithiolane-4-one [FL-no: 12.295] no data on use as flavouring substances in Europe are available and no intake figures could be calculated, which is a preclude for evaluation of the four substances using the Procedure. The remaining 71 substances were evaluated through a stepwise approach that integrates information on the structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 59 substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For 12 substances [FL-no: 12.093, 12.094, 12.097, 12.100, 12.112, 12.116, 12.120, 12.164, 12.167, 12.199, 15.102 and 15.125], evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of the flavouring substances, the specifications for the materials of commerce have also been considered and for three substances, evaluated through the Procedure, information on the specifications is lacking.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 139
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 10, Revision 3 (FGE.10Rev3): Aliphatic primary and secondary saturated and unsaturated alcohols, aldehydes, acetals, carboxylic acids and esters containing an additional oxygenated functional group and lactones from chemical groups 9, 13 and 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 63 flavouring substances in the Flavouring Group Evaluation 10, including additional two substances in this Revision 3, using the Procedure in Commission Regulation (EC) No 1565/2000. For one substance [FL-no: 10.170] a concern for genotoxicity could not be ruled out. The remaining 62 substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the 62 substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. For four substances evaluated through the Procedure, the stereoisomeric composition has not been specified sufficiently.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 127
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(39
Number: 2563
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
2.pdf
DOIs:
10.2903/j.efsa.2012.2563
Links:
http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 12, Revision 3 (FGE.12Rev3): Primary saturated or unsaturated alicyclic alcohol, aldehyde, acid, and esters from chemical group 7

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 45
Publication date: 2012
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 204 (FGE.204): Consideration of genotoxicity data on representatives for 18 mono-unsaturated, aliphatic, α,β-unsaturated ketones and precursors from chemical subgroup 1.2.1 of FGE.19 by EFSA

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider in the Flavouring Group Evaluation 205, the additional data on genotoxicity submitted by the Industry on two representative substances, oct-1-en-3-one [FL-no: 07.081] and pent-1-en-3-one [FL-no: 07.102], from subgroup 1.2.2 of FGE.19. The Panel concluded that both substances were weakly genotoxic in bacteria with pent-1-en-3-one being the most potent (previously available data). In these assays the representative substances were highly cytotoxic with a steep toxicity curve, and with a very narrow concentration range resulting in mutagenicity. Both substances were also tested in mammalian cells for gene mutations at the hprt locus and for structural and numerical chromosomal aberrations in the micronucleus assay. Also in mammalian cells the test substances were highly cytotoxic. The Panel considered that the positive effects in the bacterial mutagenicity assays of the two representative substances cannot be overruled by the one negative and one equivocal gene mutation test in mammalian cells and the Panel recommend that an in vivo Comet assay on the first site of contact (e.g. the stomach) and on the liver is requested on the most potent of the representative substances, pent-1-en-3-one.
General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 22
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(10)
Number: 2902
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
FGE.205.pdf
DOIs:
10.2903/j.efsa.2012.2902
Links:
http://www.efsa.europa.eu/
Source: dtu
Source-ID: u::5337
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); 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

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 140
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(12)
Number: 2994
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
FGE.205.pdf
DOIs:
10.2903/j.efsa.2012.2994
Links:
Source: dtu
Source-ID: u::5337
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 21, Revision 3 (FGE.21Rev3): Thiazoles, thiophenes, thiazoline and thienyl derivatives from chemical groups 29 and 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 59 flavouring substances in the Flavouring Group Evaluation 21, including an additional three substances in this Revision 3, using the Procedure in Commission Regulation (EC) No 1565/2000. Since the publication of the last revision of this FGE, the EFSA has been requested to evaluate three additional substances [FL-no: 15.057, 15.079 and 15.135], which have been included in the present revision of FGE.21. Seven of the substances [FL-no: 15.060,
15.086, 15.090, 15.099, 15.114, 15.119 and 15.133] were considered to have genotoxic potential. The remaining 52 substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 26 substances [FL-no: 15.038, 15.039, 15.044, 15.050, 15.051, 15.052, 15.058, 15.061, 15.062, 15.063, 15.067, 15.068, 15.069, 15.071, 15.078, 15.080, 15.082, 15.084, 15.085, 15.087, 15.089, 15.098, 15.108, 15.115, 15.116 and 15.118] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining 26 candidate substances [FL-no: 15.037, 15.040, 15.042, 15.043, 15.045, 15.054, 15.055, 15.057, 15.064, 15.070, 15.072, 15.074, 15.076, 15.077, 15.079, 15.088, 15.091, 15.092, 15.093, 15.094, 15.096, 15.097, 15.106, 15.107, 15.129 and 15.135] evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. For one substance [FL-no: 15.129], evaluated using the Procedure, an identity test is lacking and for four substances [FL-no: 15.042, 15.057, 15.079 and 15.135] the stereoisomeric composition has not been specified sufficiently.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 94
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Volume: 10(2)
Number: 2457
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
5.pdf
DOIs:
10.2903/j.efsa.2012.2457
Links:
http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF): Scientific Opinion on Flavouring Group Evaluation 226 (FGE.226): Consideration of genotoxicity data on one α,β-unsaturated aldehyde from chemical subgroup 1.1.1(b) of FGE.19 by EFSA
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate the genotoxic potential of one flavouring substance from subgroup 1.1.1(b) of FGE.19 in the Flavouring Group Evaluation 226. The Flavour Industry has provided additional genotoxicity studies for the substance [FL-no: 16.071] in FGE.226. Based on these new data the Panel concluded that 4,5-epoxydec-2(trans)-enal did not induce gene mutations in bacterial cells but was positive in an in vitro micronucleus assay, so, 4,5-epoxydec-2(trans)-enal is considered an in vitro genotoxic agent. The negative results obtained in an in vivo micronucleus assay cannot overrule the positive results of the in vitro micronucleus assay with and without S9-mix due to the lack of cytotoxicity in the bone marrow. On this basis, an in vivo Comet assay in rodents is recommended in order to verify possible genotoxic effects at the first site of contact (e.g., stomach/duodenum cells).

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 17
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 7, Revision 4 (FGE.07Rev4): Saturated and unsaturated aliphatic secondary alcohols, ketones and esters of secondary alcohols and saturated linear or branched-chain carboxylic acids from chemical group 5

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 49 flavouring substances in the Flavouring Group Evaluation 07, including additional five substances in this Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. Since the publication of the last revision of this FGE, the EFSA has been requested to evaluate five additional substances, 2,6-dimethylocta-1,5,7-trien-3-ol, octa-1,5-dien-3-ol, undeca-1,5-dien-3-ol, pseudo-ionone and 3,3,6-trimethylhepta-1,5-dien-4-one [FL-no: 02.145, 02.194, 02.211, 07.198 and 07.204], which have been included in the present revision of FGE.07. None of the 49 substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach that integrates information on the structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that all 49 substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of the flavouring substances, the specifications for the materials of commerce have also been considered. For three substances [FL-no: 02.194, 02.211 and 02.255] the stereoisomeric compositions have not been given and for one substance [FL-no: 07.156] information on the composition of the stereoisomeric mixture is lacking.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 78
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(10)
Number: 2899
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
21.pdf
DOIs: 10.2903/j.efsa.2012.2899
Links: http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 9, Revision 4 (FGE.09Rev4): Secondary alicyclic saturated and unsaturated alcohols, ketones and esters containing secondary alicyclic alcohols from chemical group 8 and 30, and an ester of a phenol derivative from chemical group 25

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 21 flavouring substances in the Flavouring Group Evaluation 09, Revision 4, using the Procedure in Commission Regulation (EC) No 1565/2000. The present revision of FGE.09 includes the assessment of four additional flavouring substances, p-menthan-3-one [FL-no: 07.059], 2,6,6-trimethylcyclohex-2-en-1-one [FL-no: 07.202], l-piperitone [FL-no: 07.255] and menthol 1-and 2-propylene glycol carbonate [FL-no: 09.843]. None of the
substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the 20 substances [FL-no: 02.070, 02.075, 02.135, 02.167, 06.136, 07.059, 07.202, 07.203, 07.255, 09.154, 09.355, 09.520, 09.618, 09.619, 09.621, 09.843, 09.870, 09.929, 09.935 and 09.949] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining candidate substance [FL-no: 07.207], additional toxicity data are requested (further metabolism and/or toxicity studies). Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have been considered. Specifications including complete purity criteria and identity for the materials of commerce have been provided for all candidate substances.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 73
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Volume: 10(10)
Number: 2836
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
  2.pdf
DOIs:
10.2903/j.efsa.2012.2836
Links:
http://www.efsa.europa.eu/
Publication: Research - peer-review › Report – Annual report year: 2012

EFSA; Scientific Opinion on Flavouring Group Evaluation 63, Revision 1 (FGE.63Rev1): Consideration of aliphatic secondary alcohols, ketones and related esters evaluated by JECFA (59th and 69th meetings) structurally related to saturated and unsaturated aliphatic secondary alcohols, ketones and esters of secondary alcohols and saturated linear or branched-chain carboxylic acids evaluated by EFSA in FGE.07Rev4 (2012)
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 19 aliphatic secondary alcohols, ketones and related esters evaluated by the JECFA at the 59th and 69th meetings in 2002 and 2008. This revision is made due to inclusion of six additional substances, 4,8-dimethyl-3,7-nonadien-2-ol, 6-methylhepta-3,5-dien-2-one, octa-1,5-dien-3-one, (E,E)-3,5-octadien-2-one, (3Z)-4,8-dimethyl-3,7-nonadiene-2-one and 4,8- dimethyl-3,7-nondien-2-y acetate [FL-no: 02.252, 07.099, 07.190, 07.247, 07.256 and 09.936] cleared for genotoxicity concern. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for all 19 substances considered in this FGE and agrees with the JECFA conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 37
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 17 bicyclic secondary alcohols, ketones and related esters evaluated by the JECFA at the 63rd meeting in 2004. This revision of FGE.87 is made due to consideration of two additional substances [FL-no: 02.100 and 02.101] compared to previous version. Additionally, new information on EU production volume on two substances and information on stereoisomeric composition for 13 substances are also included. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for all 17 substances considered in this FGE and agrees with the JECFA conclusion, "No safety concern at estimated levels of intake as flavouring substances" based on the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered for the substances evaluated through the Procedure and for two substances, [FL-no: 02.100 and 02.101], information on the stereoisomeric composition is lacking.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 31
Publication date: 2012

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

EFSA Scientific Opinion on Flavouring Group Evaluation 94, Revision 1 (FGE.94Rev1): Consideration of aliphatic amines and amides evaluated in an addendum to the group of aliphatic and aromatic amines and amides evaluated by the JECFA (68th meeting)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 12 aliphatic amines and...
The Panel considers this as the most appropriate procedure for evaluating the substances under consideration.

**General information**

State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, Division of Food Chemistry
Authors: EFSA publication
Number of pages: 30
Publication date: 2012

**Publication information**

Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Volume: 10(6)
Number: 2747
ISSN: 1830-5458
Main Research Area: Technical/natural sciences
Electronic versions:
3.pdf
DOIs:
10.2903/j.efsa.2012.2747
Links:
http://www.efsa.europa.eu/

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Flavouring Group Evaluation 46, Revision 1 (FGE.46Rev1): Ammonia and three ammonium salts from chemical group 30

The Scientific Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) was asked to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to evaluate four flavouring substances in the Flavouring Group Evaluation 46, Revision 1 (FGE.46Rev1), using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. These four flavouring substances belong to chemical group 30, Annex I of the Commission Regulation (EC) No 1565/2000. The present Flavouring Group Evaluation deals with ammonia [FL-no: 16.009], and three ammonia salts (diammonium sulphide [FL-no: 16.002], ammonium chloride [FL-no: 16.048] and ammonium hydrogen sulphide [FL-no: 16.059]). The flavouring substances cannot exist as geometrical or optical isomers. Two of the flavouring substances are classified into structural class I and two are classified into structural class III according to the decision tree approach presented by Cramer et al. (1978). The flavouring substance ammonia in the present group has been reported to occur naturally in a wide range of food items up to very high amounts. Hydrogen sulphide is also reported to occur naturally in a wide range of food items. In its evaluation, the Panel as a default used the "Maximised Survey-derived Daily Intake" (MSDI) approach to estimate the per capita intakes of the flavouring substances in Europe. However, when the Panel examined the information provided by the European Flavouring Industry on the use levels in various foods, it appeared obvious that the MSDI approach in a number of cases would grossly underestimate the intake by regular consumers of products flavoured at the use level reported by the Industry, especially in those cases where the annual production values were reported to be small. In consequence, the Panel had reservations about the data on use and use levels provided and the intake estimates obtained by the MSDI approach. In the absence of more precise information that would enable the Panel to make a more realistic estimate of the intakes of the flavouring substances, the Panel has decided also to perform an estimate of the daily intakes per person using a "modified Theoretical Added Maximum Daily Intake" (mTAMDI) approach based on the normal use levels reported by Industry. In those cases where the mTAMDI approach indicated that the intake of a flavouring substance might exceed its corresponding threshold of concern, the Panel decided not to carry out a formal safety assessment using the Procedure. In these cases the Panel requires more precise data on use and use levels. According to the default MSDI approach, the two flavouring substances [FL-no: 16.009 and 16.048] belonging to structural class I have estimated intakes in Europe of 34 and 140 microgram/capita/day, respectively, which are below the threshold of concern for structural class I substances (1800 microgram/person/day). The two substances belonging to structural class III have estimated intake in Europe of 62 and...
5.6 microgram/capita/day, respectively, which is below the threshold of concern for structural class III substances (90 microgram/person/day). Although the genotoxicity data for the flavouring substances in this group are limited, the available data on genotoxicity do not preclude an evaluation of the candidate substances through the Procedure. For the candidate substance ammonium chloride [FL-no: 16.048] there is a well-performed carcinogenicity study available, which indicates that the substance does not induce tumours. Ammonia is a substance that is readily absorbed in the gut. It is produced endogenously in amounts that far exceed those that are to be ingested as flavourings. The three ammonium salts are expected to give rise to ammonium ion and chloride or hydrogen sulphide. Ammonia is expected to be transported by the portal circulation to the liver and metabolised to urea by the Krebs urea cycle and subsequently excreted by the kidneys. Hydrogen sulphide is a substance that is produced endogenously. The major pathway for sulphide metabolism is oxidation to sulphate and excretion by the kidney. The major oxidation product of sulphide is thiosulphate which is then converted to sulphate. The primary location for these reactions is the liver. All four substances are accordingly expected to be metabolised to innocuous substances at the anticipated levels of intake as flavouring substances. It was noted that where toxicity data were available they were consistent with the conclusions in the present flavouring group evaluation using the Procedure. On the basis of the default MSDI approach the Panel concluded that the flavouring substances would not give rise to safety concerns at the estimated levels of intake arising from their use as flavouring substances. When the estimated intakes were based on the mTAMDI approach the values for the two substances from structural class I, ammonia and ammonium chloride [FL-no: 16.009 and 16.048], are 110000 microgram/person/day and 220000 microgram/person/day, respectively. These values are above the threshold of concern for structural class I of 1800 microgram/person/day. For one of the substances from structural class III, ammonium hydrogen sulphide [FL-no: 16.059], the mTAMDI value is 220 microgram/person/day. This value is above the threshold for structural class III of 90 microgram/person/day. For the other substance from structural class III no data are available on use and use levels. Thus, intake estimates based on the mTAMDI approach exceed the threshold of concern for the three flavouring substances in this flavouring group, and more reliable exposure data are requested for all four substances. On the basis of such additional data, these flavouring substances should be reconsidered using the Procedure. Subsequently, additional data might become necessary. In order to determine whether this evaluation could be applied to the materials of commerce, it is necessary to consider the available specifications. Specifications including complete purity criteria for the materials of commerce have been provided for the four flavouring substances. Identity tests is missing for one of the flavouring substances, ammonium hydrogen sulphide [FL-no: 16.059]. Thus, the final evaluation of the materials of commerce cannot be performed for this substance, pending further information. The remaining three flavouring substances, ammonia [FL-no: 16.009], ammonium chloride [FL-no: 16.048] and diammoniun sulfide [FL-no: 16.002] would present no safety concern at the levels of intakes estimated on the basis of the MSDI approach.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 35
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 1925
Main Research Area: Technical/natural sciences
Flavourings, safety, Amminia, Ammonia salts
Electronic versions:
FGE.46rev1.pdf
DOIs: 10.2903/j.efsa.2011.1925
Links: http://www.efsa.europa.eu/
Source: orbit
Source-ID: 278414
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 06, Revision 2 (FGE.06Rev2); Straight- and branched-chain aliphatic unsaturated primary alcohols, aldehydes, carboxylic acids, and esters from chemical groups 1 and 4
The European Food Safety Authority (EFSA) asked the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to evaluate the 48 flavouring substances in this Flavouring Group Evaluation 06, Revision 2 (FGE.06Rev2), using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. These 48 flavouring substances
belong to chemical groups 1 and 4, Annex I of the Commission Regulation (EC) No 1565/2000. The present Flavouring Group Evaluation deals with 48 straight- and branched-chain unsaturated primary alcohols, aldehydes, carboxylic acids and esters. Eight of the 48 flavouring substances possess a chiral centre [FL-no: 02.170, 02.175, 05.143, 09.341, 09.612, 09.871, 09.872 and 09.938]. Thirty-one of the 48 substances can exist as geometrical isomers [FL-no: 02.152, 02.195, 02.222, 02.234, 05.061, 05.082, 05.203, 05.217, 05.218, 05.220, 08.074, 08.102, 09.377, 09.567, 09.569, 09.572, 09.575, 09.638, 09.640, 09.643, 09.672, 09.673, 09.674, 09.674, 09.683, 09.685, 09.685, 0.9.884, 09.884, 09.937 and 09.939]. For 13 of these substances [FL-no: 02.152, 02.222, 05.061, 05.203, 05.218, 08.074, 08.102, 09.377, 09.640, 09.674, 09.674, 09.831, 09.838, 09.855, 09.871, 09.872, 09.884, 09.885] no indication has been given that one of the possible isomers has preponderance in the commercial flavouring material. Forty-six candidate substances are classified into structural class I. The remaining two substances [FL-no: 05.143 and 09.884] are classified into structural class II. Thirty-eight of the flavouring substances in the present group have been reported to occur naturally in a wide range of food items. According to the default MSDI approach, the 48 flavouring substances in this group have intakes in Europe from 0.001 to 120 microgram/capita/day, which are below the thresholds of concern value for both structural class I (1800 microgram/person/day) and structural class II (540 microgram/person/day) substances. On the basis of the reported annual production volumes in Europe (MSDI approach), the combined intake of the 46 candidate substances belonging to structural class I and of the two candidate substances belonging to structural class II would result in a total intake of approximately 255 and 0.7 microgram/capita/day, respectively. These values are below the thresholds of concern for structural class I and class II substances of 1800 and 540 microgram/person/day, respectively. The total combined estimated intake of 65 of the 70 supporting substances for which European annual production data are available and of the 46 candidate substances from structural class I is approximately 6700 microgram/capita/day, which exceeds the threshold of concern for structural class I (1800 microgram/person/day). However, the substances are expected to be efficiently metabolised and are not expected to saturate the metabolic pathways. For the substances in this group the limited data available do not give rise to safety concern with respect to genotoxicity and carcinogenicity. Except for hex-3-enyl 2-ethylbutyrate [FL-no: 09.884] the candidate substances are expected to be metabolised to innocuous substances at the estimated levels of use as flavouring substances. One of the hydrolysis products of [FL-no: 09.884], 2-ethylbutyric acid, showed teratogenic potential in one mouse subcutaneous single-dose study, and is structurally related to valproic acid, which is a known teratogen. However, an additional study in which 2-ethylbutyric acid was given by gavage to pregnant rats showed a NOAEL of 200 mg/kg bw/day of 2-ethylbutyric acid. This dose is more than 4 x 107 times higher than the MSDI for 2-ethylbutyric acid arising from the intake of the candidate substance, [FL-no: 09.884]. Accordingly, the candidate substance [FL-no: 09.884] does not pose a safety concern with respect to teratogenicity when used at the level of intake as flavouring substance estimated on the basis of the MSDI approach. It was noted that where toxicity data were available they were consistent with the conclusions in the present flavouring group evaluation using the Procedure. It is considered that on the basis of the default MSDI approach these 48 candidate substances would not give rise to safety concerns at the estimated levels of intake arising from their use as flavouring substances. When the estimated intakes were based on the mTAMDI approach they ranged from 36 to 40000 microgram/person/day for the 45 flavouring substances from structural class I for which data have been provided. Thus, the intakes were all above the threshold of concern for structural class I of 1800 microgram/person/day, except for nine flavouring substances [FL-no: 05.061, 05.174, 05.082, 05.203, 05.217, 05.218, 05.220, 09.937 and 09.939]. The estimated intakes of the two flavouring substances assigned to structural class II, based on the mTAMDI are 1600 and 3900 microgram/person/day, which is above the threshold of concern for structural class II of 540 microgram/person/day. The nine substances [FL-no: 05.061, 05.174, 05.082, 05.203, 05.217, 05.218, 05.220, 09.937 and 09.939], which have mTAMDI intake estimates below the threshold of concern for structural class I, are also expected to be metabolised to innocuous products. Thus, for 38 of the 48 flavouring substances considered in this Opinion, the intakes, estimated on the basis of the mTAMDI, exceed the relevant threshold for their structural class, to which the flavouring substance has been assigned. For one substance [FL-no: 09.647] no use levels were provided. Therefore, for these 39 substances more reliable exposure data are required. On the basis of such additional data, these flavouring substances should be reconsidered along the steps of the Procedure. Subsequently, additional data might become necessary. In order to determine whether the conclusion for the 48 candidate substances can be applied to the material of commerce, it is necessary to consider the available specifications. Adequate specifications including complete purity criteria and identity for the materials of commerce have been provided for 48 of the 48 flavouring candidate substances. An ID test is missing for [FL-no: 09.938] and a boiling point is lacking for [FL-no: 09.674]. Otherwise the specifications are adequate for all 48 candidate substances, except that information on composition of stereoisomeric mixture has not been specified sufficiently for 13 of the substances [FL-no: 02.152, 02.222, 05.061, 05.203, 05.218, 08.074, 08.102, 09.377, 09.640, 09.674, 09.831, 09.884 and 09.885]. Thus, the final evaluation of the materials of commerce cannot be performed for 14 substances [FL-no: 02.152, 02.222, 05.061, 05.203, 05.218, 08.074, 08.102, 09.377, 09.640, 09.674, 09.831, 09.884 and 09.885], pending further information. The remaining 34 substances [FL-no: 02.125, 02.138, 02.170, 02.175, 02.176, 02.195, 02.201, 02.234, 05.082, 05.143, 05.174, 05.217, 05.220, 08.100, 09.341, 09.368, 09.567, 09.569, 09.572, 09.575, 09.612, 09.638, 09.643, 09.672, 09.673, 09.838, 09.855, 0.9.885, 09.885, 09.887, 09.897, 09.928, 09.937 and 09.939] would present no safety concern at the levels of intake estimated on the basis of the MSDI approach.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 78
Publication date: 2011
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 06, Revision 3 (FGE.06Rev3): Straight- and branched-chain aliphatic unsaturated primary alcohols, aldehydes, carboxylic acids, and esters from chemical groups 1 and 4

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 50 flavouring substances in the Flavouring Group Evaluation 6, Revision 3, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the 50 substances [FL-no: 02.125, 02.138, 02.152, 02.170, 02.175, 02.176, 02.195, 02.201, 02.222, 02.234, 05.061, 05.082, 05.143, 05.174, 05.203, 05.217, 05.218, 05.220, 05.226, 08.074, 08.100, 08.102, 09.341, 09.368, 09.377, 09.567, 09.569, 09.572, 09.575, 09.612, 09.638, 09.640, 09.643, 09.672, 09.673, 09.674, 09.831, 09.838, 09.884, 09.885, 09.871, 09.872, 09.897, 09.898, 09.928, 09.937, 09.938, 09.939 and 09.950] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. For one substance [FL-no: 09.938] an identity test is missing and for two substances [FL-no: 05.226 and 09.950] the range of the specific gravity is too wide. Additional, the stereoisomeric mixture has not been specified sufficiently for 12 substances [FL-no: 02.152]

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 10, Revision 2 (FGE.10Rev2): Aliphatic primary and secondary saturated and unsaturated alcohols, aldehydes, acetals, carboxylic acids and esters containing an additional oxygenated functional group and lactones from chemical groups 9, 13 and 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 61 flavouring substances in the Flavouring Group Evaluation 10, Revision 2, using the
Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the 61 substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. For four substances, information on composition of mixture and/or stereoisomerism has not been specified sufficiently.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 124
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 2164
Main Research Area: Technical/natural sciences
Electronic versions:
prod11324300835230.FGE.10rev2.pdf
DOIs:
10.2903/j.efsa.2011.2164
Source: orbit
Source-ID: 314932
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 11, Revision 2 (FGE.11Rev2): Aliphatic dialcohols, diketones, and hydroxyketones from chemical groups 8 and 10

The Scientific Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) was asked to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to evaluate 12 flavouring substances in the Flavouring Group Evaluation 11, Revision 2 (FGE.11Rev2), using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. These 12 flavouring substances belong to chemical group 10, Annex I of the Commission Regulation (EC) No 1565/2000. The present flavouring group includes 12 candidate substances; nine alpha-diketones or their corresponding alcohols or ketalts [FL-no: 02.133, 06.134, 07.071, 07.152, 07.167, 07.168, 07.238, 07.248 and 07.260], and three beta-diketones or their corresponding hydroxyketones (of which one is a tertiary alcohol) [FL-no: 07.097, 07.165 and 07.184] all belonging to chemical groups 8 and 10. One of the 12 candidate substances possesses four chiral centres [FL-no: 06.134] two possesses two chiral centres [FL-no: 02.133 and 07.168] and four substances possesses one chiral centre [FL-no: 07.097, 07.165 and 07.184] all belonging to chemical groups 8 and 10. One of the 12 candidate substances possesses four chiral centres [FL-no: 06.134] two possesses two chiral centres [FL-no: 02.133 and 07.168] and four substances possesses one chiral centre [FL-no: 07.097, 07.165, 07.184 and 07.238]. One of the substances [FL-no: 07.260] is a mixture of four isomers. Five of the candidate substances are classified into structural class I, six are classified into structural class II and one is classified into structural class III. Eight of the 12 candidate substances in the present group have been reported to occur naturally in a wide range of food items. In its evaluation, the Panel as a default used the "Maximised Survey-derived Daily Intake" (MSDI) approach to estimate the per capita intakes of the flavouring substances in Europe. However, when the Panel examined the information provided by the European Flavour Industry on the use levels in various foods, it appeared obvious that the MSDI approach in a number of cases would grossly underestimate the intake by regular consumers of products flavoured at the use level reported by the Industry, especially in those cases where the annual production values were reported to be small. In consequence, the Panel had reservations about the data on use and use levels provided and the intake estimates obtained by the MSDI approach. In the absence of more precise information that would enable the Panel to make a more realistic estimate of the intakes of the flavouring substances, the Panel has decided also to perform an estimate of the daily intakes per person using a "modified Theoretical Added Maximum Daily Intake" (mTAMDI) approach based on the normal use levels reported by Industry. In those cases where the mTAMDI approach indicated that the intake of a flavouring substance might exceed its corresponding threshold of concern, the Panel decided not to carry out a formal safety assessment using the Procedure. In these cases the Panel requires more precise data on use and use levels. According to the default MSDI approach, the 12 candidate substances have European daily per capita intakes ranging from 0.0012 to 15 microgram, which are below the thresholds of concern for structural class I, II and III (1800, 540 and 90 microgram/person/day, respectively). The candidate substance 3-methyl-2,4-nonadione [FL-no: 07.184] contains a structural 2,4-dione element similar to pentan-2,4-dione. The only genotoxicity data available for this substance was a valid unpublished GLP study in S. typhimurium and E. coli which were both negative. Similar negative result was obtained for pentan-2,4-dione in a valid GLP study in Salmonella, however, positive genotoxicity results were obtained in other studies both in vitro and in vivo. Due to this
anticipated structural alert for genotoxicity (the 2,4-dione structure) the Procedure was not applied for 3-methyl-2,4-nonadione [FL-no: 07.184] and accordingly additional data on genotoxicity are required. For the remaining candidate substances, genotoxicity data are only available for a limited number of substances, and the genotoxicity could not be assessed adequately. However, the genotoxicity data available on these remaining 11 candidate substances do not preclude evaluation using the Procedure. Ten of the 11 flavouring substances evaluated through the Procedure are expected to be metabolised to innocuous products. For the remaining candidate substance evaluated through the Procedure, diacetyl-trimer [FL-no: 06.134] the data available do not allow to anticipate hydrolysis to innocuous products. No No Observed Adverse Effect Level (NOAEL) exists for the substance or a structurally related substance to provide an adequate margin of safety under the conditions of intended use and accordingly additional data are required. It was noted that where toxicity data were available they were consistent with the conclusions in the present flavouring group evaluation using the Procedure. It is considered that on the basis of the default MSDI approach the ten of the 11 candidate substances evaluated through the Procedure [FL-no: 02.133, 07.071, 07.097, 07.152, 07.165, 07.167, 07.168, 07.238, 07.248 and 07.260] would not give rise to safety concerns at the estimated levels of intake arising from their use as flavouring substances. When the estimated intakes were based on the mTAMDI they ranged from 1600 to 3900 microgram/person/day for the five candidate substances from structural class I. For one of these candidate substances [FL-no: 02.133] the estimated intake is above the threshold of concern of 1800 microgram/person/day for structural class I. For the six candidate substances, which are assigned to structural class II, the estimated intake based on the mTAMDI range from 1500 to 5400 microgram/person/day, which is above the threshold of concern for structural class II of 540 microgram/person/day. For the one candidate substance [FL-no: 07.168] from structural class III the mTAMDI value is 1600 microgram/person/day, which exceeds the threshold of concern for structural class III of 90 microgram/person/day. The four candidate substances [FL-no: 07.097, 07.165, 07.167, 07.238], which have mTAMDI intake estimates below the threshold of concern for structural class I are also expected to be metabolised to innocuous products. Thus, for seven of the 11 candidate substances evaluated through the Procedure [FL-no: 02.133, 06.134, 07.071, 07.152, 07.168, 07.248 and 07.260] the intakes, estimated on the basis of the mTAMDI exceed the threshold for the structural class, to which the flavouring substances have been assigned. Therefore, more reliable exposure data are required. On the basis of such additional data, the substances should be reconsidered along the steps of the Procedure. Following this procedure additional toxicological data might become necessary. In order to determine whether the conclusion for the candidate substances can be applied to the materials of commerce, it is necessary to consider the available specifications. The stereoisomeric compositions have not been specified for three of the substances [FL-no: 06.134, 07.184 and 07.260]. One of the substances [FL-no: 07.260] is a mixture of four isomers (three positional isomers, where one of these can exists as two stereoisomers) and the composition of mixture is not specified. Furthermore, for [FL-no: 07.097] the minimum assay is too low, so information on secondary components of [FL-no: 07.097] is missing. Thus, the final evaluation of the materials of commerce cannot be performed for four substances [FL-no: 06.134, 07.097, 07.184 and 07.260], pending further information. For the candidate substance diacetyl-trimer [FL-no: 06.134] additional metabolism/toxicity data are required, and for 3-methyl-2,4-nonadione [FL-no: 07.184] data on genotoxicity are required before it can be evaluated through the Procedure. The remaining eight substances [FL-no: 02.133, 07.071, 07.152, 07.165, 07.167, 07.168, 07.248 and 07.260] would present no safety concern at the levels of intake estimated on the basis of the MSDI approach.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 52
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: EFSA Journal
Number: 1170
Main Research Area: Technical/natural sciences

Electronic versions:
1170.pdf
DOIs:
10.2903/j.efsa.2011.1170
Links:
Source: orbit
Source-ID: 286754
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 12, Revision 2 (FGE.12Rev2): Primary saturated or unsaturated alicyclic alcohol, aldehyde, acid, and esters from chemical group 7
The European Food Safety Authority (EFSA) asked the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to evaluate nine flavouring substances in the Flavouring Group Evaluation 12, Revision 2 (FGE.12Rev2), using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. These nine flavouring substances belong to chemical group 7, Annex I of the Commission Regulation (EC) No 1565/2000. FGE.12Rev2 includes the assessment of two additional flavouring substances compared to FGE.12Rev1. The present FGE.12Rev2 deals in total with nine primary saturated or unsaturated alicyclic alcohol, aldehyde, acid and esters belonging to chemical group 7. Seven of the nine flavouring substances possess one or more chiral centres and additionally, and due to the presence of a double bond, one of these substances can exist as geometric isomer. For two of these substances, the stereoisomeric composition has not been specified. The nine flavouring substances are classified into structural class I. Three of the flavouring substances in the present group have been reported to occur in essential oils. In its evaluation, the Panel as a default used the “Maximised Survey-derived Daily Intake” (MSDI) approach to estimate the per capita intakes of the flavouring substances in Europe. However, when the Panel examined the information provided by the European Flavouring Industry on the use levels in various foods, it appeared obvious that the MSDI approach in a number of cases would grossly underestimate the intake by regular consumers of products flavoured at the use level reported by the Industry, especially in those cases where the annual production values were reported to be small. In consequence, the Panel had reservations about the data on use and use levels provided and the intake estimates obtained by the MSDI approach. In the absence of more precise information that would enable the Panel to make a more realistic estimate of the intakes of the flavouring substances, the Panel has decided also to perform an estimate of the daily intakes per person using a “modified Theoretical Added Maximum Daily Intake” (mTAMDI) approach based on the normal use levels reported by Industry. In those cases where the mTAMDI approach indicated that the intake of a flavouring substance might exceed its corresponding threshold of concern, the Panel decided not to carry out a formal safety assessment using the Procedure. In these cases the Panel requires more precise data on use and use levels. According to the default MSDI approach, the nine flavouring substances in this group have intakes in Europe from 0.011 to 43 micrograms/capita/day, which are below the threshold of concern value for structural class I (1800 micrograms/person/day) substances. The flavouring substances are expected to be metabolised to innocuous products at the estimated levels of intake as flavouring substances. The genotoxic potential of this group of flavouring substances cannot be assessed since information on the flavouring substances or on structurally related substances is missing. However, this does not preclude evaluation of the flavouring substances in the present group using the Procedure (SCF, 1999a). It is considered that on the basis of the default MSDI approach these nine flavouring substances would not give rise to safety concerns at the estimated levels of intake arising from their use as flavouring substances. When the estimated intakes were based on the mTAMDI they ranged from 1600 to 5000 micrograms/person/day for the nine flavouring substances from structural class I. For six of the substances the intakes were above the threshold of concern for structural class I of 1800 micrograms/person/day. Thus, for these six of the nine flavouring substances considered in this Opinion the intakes, estimated on the basis of the mTAMDI, exceed the relevant threshold for their structural class, to which the flavouring substance has been assigned. Therefore, for these six substances [FL-no: 02.134, 02.186, 08.135, 09.342, 09.670 and 09.829] more reliable exposure data are required. On the basis of such additional data, these flavouring substances should be reconsidered along the steps of the Procedure. Following this procedure additional toxicological data might become necessary. The three substances which have mTAMDI intake estimates below the threshold of concern for structural class I, are also expected to be metabolised to innocuous products. In order to determine whether this evaluation could be applied to the material of commerce, it is necessary to consider the available specifications. Specifications including complete purity criteria and identity for the materials of commerce have been provided for the nine flavouring substances. Information on the stereoisomeric composition for four of these substances [FL-no: 02.186, 05.157, 05.198 and 09.670] has not been specified sufficiently, as the Flavour Industry has informed that these substances consists of a “mixture of isomers”. However, the isomeric composition of the mixtures have to be provided. Thus, the final evaluation of the materials of commerce cannot be performed for these four substances, pending further information. The five remaining substances [FL-no: 02.134, 05.183, 08.135, 09.342 and 09.829] would present no safety concern at the estimated levels of intake based on the MSDI approach.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 13, Revision 2 (FGE.13 Rev2) Furfuryl and furan derivatives with and without additional side-chain substituents and heteroatoms from chemical group 14

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 27 flavouring substances in the Flavouring Group Evaluation 13, Revision 2, using the Procedure in Commission Regulation (EC) No 1565/2000. Three of the substances [FL-no: 13.125, 13.155 and 13.162] were considered to have genotoxic potential. The remaining 24 substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the 24 substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Adequate specifications including complete purity criteria and identity for the materials of commerce have been provided for all 24 flavouring substances evaluated through the Procedure.

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 17, Revision 2 (FEG.17Rev2): Pyrazine derivatives from chemical group 24

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 21 flavouring substances in the Flavouring Group Evaluation 17, Revision 2, using the Procedure in Commission Regulation (EC) No 1565/2000. From the in vitro data available, genotoxic potential is indicated for the flavouring substances quinoxaline [FL-no: 14.147] and 2-methylquinoxaline [FL-no: 14.139]. Therefore, the Panel decided that the Procedure could not be applied to these two substances, so adequate genotoxicity data should be provided. For one substance [FL-no: 14.051] no intake data are available preventing it from being evaluated through the Procedure. The remaining 18 substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 17 substances [FL-no: 14.081, 14.083, 14.084, 14.086, 14.087, 14.091, 14.097, 14.099, 14.101, 14.102, 14.108, 14.113, 14.122, 14.127, 14.129, 14.148, and 14.161] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining substance [FL-no: 14.052] additional toxicity data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for two substances information on specifications is lacking.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 17, Revision 3 (FGE.17Rev3): Pyrazine derivatives from chemical group 24

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 28 flavouring substances in the Flavouring Group Evaluation 17, including seven additional substances considered in this Revision 3, using the Procedure in Commission Regulation (EC) No 1565/2000. From the in vitro data available, genotoxic potential is indicated for the flavouring substances quinoxaline [FL-no: 14.147] and 2-methylquinoxaline [FL-no: 14.139]. Therefore, the Panel decided that the Procedure could not be applied to these two substances, until adequate data showing absence of genotoxicity are provided. For one substance [FL-no: 14.051] no intake data are available preventing it from being evaluated through the Procedure. The remaining 25 substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 24 substances [FL-no: 14.057, 14.081, 14.083, 14.084, 14.086, 14.087, 14.091, 14.097, 14.099, 14.101, 14.102, 14.108, 14.109, 14.111, 14.112, 14.113, 14.122, 14.126, 14.127, 14.128, 14.129, 14.148, 14.161 and 14.170] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining substance [FL-no: 14.052], additional toxicity data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for one substance [FL-no: 14.102], the composition of mixture has not been specified sufficiently.
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 32 flavouring substances in the Flavouring Group Evaluation 18, Revision 2, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 28 substances [FL-no: 02.041, 02.052, 02.054, 02.120, 02.123, 02.129, 02.140, 02.144, 02.147, 02.149, 02.150, 02.168, 02.171, 02.181, 02.184, 02.197, 02.203, 02.206, 02.219, 02.226, 02.230, 02.253, 09.171, 09.356, 09.614, 09.617, 09.671 and 09.808] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining four substances [FL-no: 02.146, 02.185, 02.191 and 09.669] no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for six substances information is lacking.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication, Frandsen, H. L. (Intern)
Number of pages: 91
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 1847
Main Research Area: Technical/natural sciences
Electronic versions: 1847.pdf
DOIs: 10.2903/j.efsa.2011.1847
Source: orbit
Source-ID: 286726
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 206 (FGE.206): Consideration of genotoxicity data on representatives for 12 alpha,beta-unsaturated ketones and precursors from chemical subgroup 1.2.3 of FGE.19 by EFSA

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 16
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 1922
Main Research Area: Technical/natural sciences
Electronic versions: prod11320245295336.FGE.206.pdf
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 209 (FGE.209): Consideration of genotoxicity data on one alpha,beta-unsaturated aldehyde from chemical subgroup 2.3 of FGE.19 by EFSA

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 12
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 1992
Main Research Area: Technical/natural sciences
Electronic versions:
1992.pdf
DOIs:
Links:
Source: orbit
Source-ID: 286738
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 20, Revision 3 (FGE.20Rev3): Benzyl alcohols, benzaldehydes, a related acetal, benzoic acids, and related esters from chemical groups 23 and 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider in this revision 3 of Flavouring Group Evaluation 20, the SCF Opinion on benzoic acid. Furthermore information on stereoisomeric composition for two substances [FL-no: 06.104 and 09.570] and new information to support the re-allocation of the structural class for the candidate substance piperonyl alcohol [FL-no: 02.205] has been submitted. The 41 flavouring substances in Flavouring Group Evaluation 20 were evaluated using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that all the substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 136
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 211 (FGE.211): Consideration of genotoxicity data on representatives for one alpha, beta-unsaturated ketone and three precursors from chemical subgroup 2.5 of FGE.19 by EFSA

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 13
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 1993
Main Research Area: Technical/natural sciences
Electronic versions:
1993.pdf
DOIs:
Links:
Source: orbit
Source-ID: 286742
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 212 Rev1 (FGE.212 Rev1):alpha,beta-Unsaturated alicyclic ketones and precursors from chemical subgroup 2.6 of FGE.19

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 29
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 1923
Main Research Area: Technical/natural sciences
Electronic versions:
1923.pdf
DOIs:
10.2903/j.efsa.2011.1923
Links:
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 218, Revision 1 (FGE.218Rev1): alpha,beta-Unsaturated aldehydes and precursors from subgroup 4.2 of FGE.19: Furfural derivatives

The European Food Safety Authority (EFSA) asked the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to evaluate flavouring substances using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. In the present revision of FGE.218, FGE.218Rev1, there has been a reassessment of one candidate substance, 5-methylfurfural [FL-no: 13.001], for which there was a request for genotoxicity data in FGE.218. flavouring Group Evaluation 218 (FGE.218) consists of furfural [FL-no: 13.018] and seven substances structurally related to furfural, 5-methylfurfural [FL-no: 13.001], furfuryl alcohol [FL-no: 13.019] and five esters of furfuryl alcohol and aliphatic saturated carboxylic acids [FL-no: 13.057, 13.062, 13.067, 13.068 and 13.128]. In the previous version of this Opinion, FGE.218, the Panel had expressed the following view. The five furfuryl esters are anticipated to be hydrolysed to furfuryl alcohol (and carboxylic acids). Furfuryl alcohol is expected to be oxidised to the alpha,beta-unsaturated aldehyde furfural. However, based on the data then available the Panel concluded that furfural is not of concern with respect to genotoxicity. Furthermore, the Panel concluded that not only furfural but also the structurally related furfuryl alcohol and the five furfuryl esters are not of concern with respect to genotoxicity. Accordingly these seven substances can be evaluated through the Procedure in FGE.66. In the FGE.218 Opinion of 2008 the Panel also expressed its view on 5-hydroxymethylfurfural and 5-methylfurfural. It is anticipated that 5-methylfurfural [FL-no: 13.001] can be oxidised to the primary alcohol 5-hydroxymethylfurfural [FL-no: 13.139]. 5-Hydroxymethylfurfural has been evaluated by EFSA in FGE.13 dealing with furfuryl and furan derivatives. In the latter Opinion, it was concluded that since 5-hydroxymethylfurfural may be metabolised to 5-[(sulphoxy)methyl]furfural which shows genotoxic potential in vitro, 5-hydroxymethylfurfural could not be evaluated through the Procedure. Accordingly, the Panel concluded that 5-methylfurfural could not be evaluated through the Procedure either. Industry has submitted additional data on the 5-hydroxymethylfurfural including metabolism, genotoxicity and carcinogenicity data. Based on these data and further genotoxicity studies identified by EFSA, the Panel concluded that, notwithstanding the indications of in vitro genotoxicity in conditions that favour the formation of 5-[(sulphoxy)methyl]furfural and the limited in vivo genotoxicity study, the essentially negative results of the carcinogenicity studies in rats and mice indicate that 5-hydroxymethylfurfural is of no concern under the conditions of intended use. This conclusion is also applicable to 5-methylfurfural, a candidate substance in the current FGE.218Rev1, because this substance may be metabolised to 5-hydroxymethylfurfural. Accordingly, both 5-hydroxymethylfurfural [FL no: 13.001] and 5-methylfurfural [FL-no: 13.139] can be evaluated through the Procedure.
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 56 flavouring substances in the Flavouring Group Evaluation 21, Revision 2, using the Procedure in Commission Regulation (EC) No 1565/2000. Seven of the substances [Fl-no: 15.060, 15.086, 15.090, 15.099, 15.114, 15.119 and 15.133] were considered to have genotoxic potential. The remaining 49 substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that 26 substances FL-no: 15.038, 15.039, 15.044, 15.050, 15.051, 15.052, 15.058, 15.061, 15.062, 15.063, 15.067, 15.068, 15.069, 15.071, 15.078, 15.080, 15.082, 15.084, 15.085, 15.087, 15.089, 15.098, 15.108, 15.115, 15.116 and 15.118] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining 23 candidate substances [FL-no: 15.037, 15.040, 15.042, 15.043, 15.045, 15.054, 15.055, 15.064, 15.070, 15.072, 15.074, 15.076, 15.077, 15.088, 15.091, 15.092, 15.093, 15.094, 15.096, 15.097, 15.106, 15.107 and 15.129], of the 49 substances evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. For two substances are an identity test lacking and for one has the stereoisomeric composition to be specified.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 86
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 1989
Main Research Area: Technical/natural sciences
Electronic versions:
prod11320246530339.FGE.21rev2.pdf
DOI:
10.2903/j.efsa.2011.198
Links:
Source: orbit
Source-ID: 286605
Publication: Research - peer-review › Report – Annual report year: 2011


The European Food Safety Authority (EFSA) asked the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was asked to evaluate flavouring substances using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. The present revision of FGE.220, FGE.220Rev1, concerns the evaluation of additional data submitted by Industry in response to the requested genotoxicity data in FGE.220 on the representative substance for subgroup 4.4b, 4-hydroxy-2,5-dimethylfuran-3(2H)-one [FL-no: 13.010]. Flavouring Group Evaluation 220 (FGE.220) concerns 10 substances, corresponding to subgroup 4.4 of FGE.19. The 10 substances are alpha,beta-unsaturated 3(2H)-furanones [FL-no: 13.010, 13.084, 13.085, 13.089, 13.099, 13.117, 13.119, 13.157, 13.175 and 13.176]. The substances were further subdivided into two subgroups as five of the 10 substances can only exist as alpha,beta-unsaturated ketones (subgroup 4.4a) while in the other five substances the alpha,beta double bond can be involved in keto-enol tautomerism (subgroup 4.4b). For the substances in subgroup 4.4a [FL-no: 13.089, 13.117, 13.119, 13.157 and 13.175], the previous conclusions of the Panel in FGE.220 were that the available data on genotoxicity were too limited to evaluate these substances through the Procedure. Additional studies were needed as outlined in the Genotoxicity Test Strategy for Substances belonging to Subgroups of FGE.19 (EFSA, 2008bb). For the substances in subgroup 4.4b [FL-no: 13.010, 13.084, 13.085, 13.099 and 13.176], the Panel had in FGE.220 expressed the view that evidence for genotoxicity was available both in vitro and in vivo. Evidence from in vitro studies indicated that the genotoxicity of the candidate substances in this subgroup may be caused by indirect (thresholded) mechanisms of action (in particular generation of reactive oxygen species). The concern for carcinogenicity was alleviated, since one of the substances, for which positive genotoxicity data in mice were obtained, was not carcinogenic in a valid chronic assay in rats. Therefore, no further genotoxicity tests in somatic cells were required. However, some evidence was also available that this substance might elicit genotoxic effects in germ cells, which theoretically may result in reduced reproductive capacity or in inheritable
genetic damage. Reduced reproductive capacity and inheritable genetic damage are toxicological endpoints which differ from carcinogenicity and therefore, the negative results for the carcinogenicity study could not be used to overrule this concern. It is not clear if (and if so to what extent) the thresholded mechanism mentioned above would be relevant for genotoxic effects in the germ cells. Therefore, the Panel conclusions of the previous evaluation in FGE.220 were that these five substances could not be evaluated through the Procedure. The Panel recognised that the studies which provided indications for germ cell genotoxicity were of limited validity. For this reason a robust GLP-controlled cytogenetic investigation in mouse spermatocytes according to the OECD guideline 483 was requested. In March 2009 the Flavouring Industry submitted new data in reply to the above requested data for subgroup 4.4b of FGE.220. These data have now been examined by the Panel which has concluded the following. The results of a valid rat fertility and dominant lethal study have shown that the representative substance for subgroup 4.4b, 4-hydroxy-2,5-dimethylfuran-3(2H)-one [FL-no: 13.010], is unable to induce adverse effects both on male rat reproductive capacity and dominant lethality. On this basis, the Panel concludes that there is no concern for this substance to induce heritable genetic damage or adverse effects on male reproductive capacity. Accordingly the substances in subgroup 4.4b of FGE.19 [FL-no: 13.010, 13.084, 13.085, 13.099 and 13.176] can be evaluated using the Procedure. Since no data were submitted to further evaluate the genotoxic potential of the substances in subgroup 4.4a, the Panel maintains its position that for this subgroup additional data on genotoxicity are needed. © European Food Safety Authority, 2011

### General information
- **State:** Published
- **Organisations:** Division of Toxicology and Risk Assessment, National Food Institute
- **Authors:** EFSA Publication
- **Number of pages:** 26
- **Publication date:** 2011

### Publication Information
- **Publisher:** European Food Safety Authority
- **Original language:** English
- **Series:** EFSA Journal
- **Number:** 1841
- **Main Research Area:** Technical/natural sciences
- **3(2H)-furanones, Safety evaluation, Flavouring substances, Alpha, Beta-Unsaturated ketones
- **Electronic versions:** FGE.220rev1.pdf
- **DOIs:** 10.2903/j.efsa.2011.1841
- **Source:** orbit
- **Source-ID:** 278411
- **Publication:** Research - peer-review › Report – Annual report year: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 22, Revision 1 (FGE.22Rev1): Ring substituted phenolic substances from chemical groups 21 and 25

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 28 flavouring substances in the Flavouring Group Evaluation 22, Revision 1, using the Procedure in Commission Regulation (EC) No 1565/2000. The substance 3,4-methylenedioxyphenol [FL-no: 04.080] was reported to have a genotoxic potential in vitro, while in vivo studies were not available. Therefore, the Panel concluded that the Procedure could not be applied to this substance until adequate genotoxicity data become available. The remaining 27 substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that these 27 candidate substances do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Adequate specifications for the materials of commerce are available for all 27 flavouring substances evaluated through the Procedure.

### General information
- **State:** Published
- **Organisations:** Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
- **Authors:** EFSA Publication
- **Number of pages:** 89
- **Publication date:** 2011

### Publication Information
- **Place of publication:** Parma, Italy
The European Food Safety Authority (EFSA) asked the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to evaluate 19 flavouring substances in the Flavouring Group Evaluation 23, Revision 2 (FGE.23Rev2), using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. These 19 flavouring substances belong to chemical groups 15, 16, 22, 26 and 30, Annex I of the Commission Regulation (EC) No 1565/2000. The present Flavouring Group Evaluation deals with 19 candidate substances, which are aliphatic, alicyclic and aromatic ethers including anisole derivatives. Four of the candidate substances are aliphatic ethers, one is an alicyclic ether, three are alicyclic hydrocarbons with an ether side chain, two are ethers containing a benzene moiety, eight are phenol ethers and one is a naphthol ether. Five of the 19 candidate substances possess one or more chiral centres and three can exist as geometrical isomers. For one substance [FL-no: 03.022] Industry has informed that it occurs as a mixture of E- & Z-isomers, however, the composition of the mixture has to be specified. Two of the flavouring substances are classified into structural class I, seven are classified into structural class II and 10 are classified into structural class III. Ten of the substances in the present group have been reported to occur naturally in a wide range of food items. In its evaluation, the Panel has reservations about the data on use and use levels provided and the intake estimates obtained by the MSDI approach. In the absence of more precise information that would enable the Panel to make a more realistic estimate of the intake of the flavouring substances, the Panel has decided also to perform an estimate of the daily intakes per person using a “modified Theoretical Added Maximum Daily Intake” (mTAMDI) approach based on the normal use levels reported by Industry. In those cases where the mTAMDI approach indicated that the intake of a flavouring substance might exceed its corresponding threshold of concern, the Panel decided not to carry out a formal safety assessment using the Procedure. In these cases the Panel requires more precise data on use and use levels. According to the default MSDI approach, the 19 flavouring substances in this group have intakes in Europe from 0.011 to 49 micrograms/capita/day, which are below the threshold of concern value for structural class I of 1800 micrograms/person/day, for structural class II of 540 micrograms/person/day and for structural class III of 90 micrograms/person/day. On the basis of the reported annual production in Europe (MSDI approach), the combined intake of the two candidate substances belonging to structural class I, of the seven candidate substances belonging to structural class II and of the 10 candidate substances belonging to structural class III, would result in combined intakes of approximately 1.2, 52 and 26 micrograms/capita/day, respectively. These values are lower than the thresholds of concern for structural class I, II or III substances. The estimated total combined intakes of the candidate and supporting substances (in Europe) are approximately 2800, 1300 and 130 micrograms/capita/day for structural class I, II and III substances, respectively. The combined daily per capita intake of 2800 micrograms exceeds the threshold of concern of 1800 micrograms/person/day for structural class I substances. The supporting substances were evaluated at the 51st JECFA meeting, where it was noted that although the combined intake exceeds the threshold, the substances are expected to be efficiently metabolised and would not saturate the metabolic pathways. The Panel agreed with this view and concluded that the combined intake of about 1.2 micrograms/capita/day for the candidate substances in structural class I is negligible compared to the combined intake of 2800 micrograms/capita/day of the supporting substances. Likewise the total combined intake of the seven candidate substances and ten supporting substances from structural class II is approximately 1300 micrograms/capita/day, which exceeds the threshold of concern for a compound belonging to structural class II of 540 micrograms/person/day. The supporting substances in structural class II were evaluated at the 61st JECFA meeting, where it was noted that although the combined intake exceeds the threshold, the substances are expected to be efficiently metabolised and would not saturate the metabolic pathways. The Panel agreed with this view and concluded that the combined intake of about 52 micrograms/capita/day for the candidate substances in structural class II is negligible.
compared to the combined intake of 1250 micrograms/capita/day of the supporting substances. The total combined intake of candidate and supporting substances of structural class III is 130 micrograms/capita/day, which is above the threshold of concern for structural class III of 90 micrograms/capita/day. The supporting substances were evaluated by the JECFA at the 59th and 61st meetings, where it was noted that although the combined intake exceeds the threshold for the structural class, the substances are expected to be efficiently metabolised and would not saturate the metabolic pathways. The Panel agreed with this view and concluded that the combined intake of about 26 micrograms/capita/day for the candidate substances in structural class III is minor compared to the combined intake of 100 micrograms/capita/day of the supporting substances. For the substances in this group, the available data on genotoxicity do not give rise to safety concern. According to the available data on supporting substances, it is expected that all 19 candidate substances in this group [FL-no: 02.247, 02.248, 03.008, 03.011, 03.012, 03.015, 03.016, 03.020, 03.022, 03.024, 04.059, 04.067, 04.068, 04.069, 04.075, 04.079, 04.084, 08.127 and 09.687] would be metabolised to innocuous products at the reported levels of intake as flavouring substances. It was noted that no repeated dose toxicity studies have been provided for any of the candidate substances and only a few studies were available on supporting substances. However, these toxicological data were consistent with the conclusions in the present Flavouring Group Evaluation using the Procedure. It was concluded that on the basis of the default MSDI approach the 19 candidate substances would not give rise to safety concerns at estimated levels of intake arising from their use as flavouring substances. When the estimated intakes were based on the mTAMDI approach they were 3200 micrograms/person/day for the two flavouring substances belonging to structural class I and for six of the seven flavouring substances belonging to structural class II, for the remaining flavouring substance from class II it is 14000 micrograms/person/day. These intakes are above the threshold of concern for structural class I of 1800 micrograms/person/day and for structural class II of 540 micrograms/person/day. For eight of the ten candidate substances belonging to structural class III the mTAMDI are 3200 or 3900 micrograms/person/day, which are above the threshold of concern of 90 microgram/person/day. For one substance from structural class III the mTAMDI of 58 micrograms/person/day is below the threshold. This substance is also expected to be metabolised to innocuous products. For one substance the mTAMDI could not be estimated as no use levels have been provided. Thus, for 17 of the 19 flavouring substances considered in this Opinion the intakes, estimated on the basis of the mTAMDI, exceed the relevant threshold for their structural class, to which the flavouring substances have been assigned. Therefore, for these 17 substances, and for [FL-no: 02.248] for which use levels are missing, more reliable exposure data are required. On the basis of such additional data, these flavouring substances should be reconsidered along the steps of the Procedure. Following this procedure additional toxicological data might become necessary. In order to determine whether the conclusion for the 19 candidate substances can be applied to the materials of commerce, it is necessary to consider the available specifications. Specifications including purity criteria and identity for the materials of commerce have been provided for all 19 flavouring substances. Information on the stereoisomeric composition is missing for one of the substances [FL-no: 03.022], as Industry has informed that it occurs as a mixture of E- & Z-isomers, however, the composition of the mixture has to be specified. Thus, the final evaluation of the materials of commerce cannot be performed for this substance, pending further information. The remaining 18 substances [FL-no: 02.247, 02.248, 03.008, 03.011, 03.012, 03.015, 03.016, 03.020, 03.024, 04.059, 04.067, 04.068, 04.069, 04.075, 04.079, 04.084, 08.127 and 09.687] would present no safety concern at the estimated levels of intake based on the MSDI approach.
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 20 flavouring substances in the Flavouring Group Evaluation 23, Revision 3, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that all 20 substances [FL-no: 02.247, 02.248, 03.008, 03.011, 03.012, 03.015, 03.016, 03.020, 03.022, 03.024, 04.059, 04.067, 04.068, 04.069, 04.075, 04.079, 04.084, 08.127, 09.687 and 13.200] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Specifications including complete purity criteria and identity for the materials of commerce have been provided for all 20 candidate substances.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 72
Publication date: 2011

Electronic versions:
prod11320246487209.FGE.23rev3.pdf
DOIs:
10.2903/j.efsa.2011.2398
Links:
Source: orbit
Source-ID: 286608
Publication: Research - peer-review › Report – Annual report year: 2011


The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 37 flavouring substances in the Flavouring Group Evaluation 25, Revision 2, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the ten substances [FL-no: 01.001, 01.027, 01.028, 01.033, 01.034, 01.038, 01.039, 01.046, 01.054 and 01.057] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining 27 candidate substances [FL-no: 01.021, 01.022, 01.023, 01.030, 01.031, 01.032, 01.035, 01.036, 01.037, 01.042, 01.043, 01.044, 01.047, 01.050, 01.051, 01.052, 01.053, 01.055, 01.056, 01.058, 01.059, 01.060, 01.064, 01.066, 01.067, 01.070 and 10.078] no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. For five substances, the composition of the stereoisomeric mixture has to be specified further.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 126
Publication date: 2011

Electronic versions:
prod13653823288207.FGE.25rev2FGE.31.pdf
DOIs:
10.2903/j.efsa.2011.2866
Links:
Source: orbit
Source-ID: 280608
Publication: Research - peer-review › Report – Annual report year: 2011
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 300 (FGE.300): One cyclo-aliphatic amide from chemical group 33

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate a flavouring substance in the Flavouring Group Evaluation 300 using the Procedure in Commission Regulation (EC) No 1565/2000. The substance was not considered to have genotoxic potential. The substance was evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that for the substance [FL-no: 16.115] evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of this flavouring substance, the specifications for the materials of commerce have also been considered. The composition of the stereoisomeric mixture has to be specified.

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 301 (FGE.301): A sulphur substituted pyrimidin-derivative and its hydrochloride salt

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate two flavouring substances, 4-amino-5,6-dimethylthieno[2,3-d]pyrimidin-2(1H)-one [FL-no: 16.116] and 4-amino-5,6-dimethylthieno[2,3-d]pyrimidin-2(1H)-one hydrochloride [FL-no: 16.120] in the Flavouring Group Evaluation 301, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the two substances [FL-no: 16.116 and 16.120] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 303 (FGE.303): Spilanthol from chemical group 30

The Scientific Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) was asked to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to evaluate one flavouring substance in the Flavouring Group Evaluation 303, using the Procedure as referred to in the Commission Regulation (EC) No 1565/2000. The flavouring substance belongs to chemical group 30, Annex I of the Commission Regulation (EC) No 1565/2000. The candidate substance spilanthol [FL-no: 16.121] is a branched chain unsaturated aliphatic amide from chemical group 30. The substance has been presented with specification of the stereoisomeric composition. The candidate substance was assigned to structural class III, according to the decision tree approach presented by Cramer et al., 1978. According to the Flavour Industry spilanthol has been identified in the plant Spilanthes oleracea, which is used in some countries as a spice. In its evaluation, the Panel as a default used the "Maximised Survey-derived Daily Intake" (MSDI) approach to estimate the per capita intakes of the flavouring substances in Europe. However, when the Panel examined the information provided by the European Flavouring Industry on the use levels in various foods, it appeared obvious that the MSDI approach in a number of cases would grossly underestimate the intake by regular consumers of products flavoured at the use level reported by the Industry, especially in those cases where the annual production values were reported to be small. In consequence, the Panel had reservations about the data on use and use levels provided and the intake estimates obtained by the MSDI approach. In the absence of more precise information that would enable the Panel to make a more realistic estimate of the intakes of the flavouring substances, the Panel has decided also to perform an estimate of the daily intakes per person using a "modified Theoretical Added Maximum Daily Intake" (mTAMDI) approach based on the normal use levels reported by Industry. In those cases where the mTAMDI approach indicated that the intake of a flavouring substance might exceed its corresponding threshold of concern, the Panel decided not to carry out a formal safety assessment using the Procedure. In these cases the Panel requires more precise data on use and use levels. Genotoxicity data are not available for the candidate substance spilanthol [FL-no: 16.121]. However, the Panel considers that the lack of genotoxicity data do not preclude the evaluation of this aliphatic amide by using the Procedure. The candidate substance cannot be anticipated to be metabolised to innocuous products. According to the default MSDI approach, the candidate substance in this group has an intake in Europe of 24 micrograms/capita/day [FL-no: 16.121]. For the candidate substance, this is below the threshold of concern value for structural class III (90 micrograms/person/day). When the estimated intake was based on the mTAMDI approach it is 830 micrograms/person/day for the candidate substance from structural class III, which is above the threshold of concern for structural III of 90 micrograms/person/day. Therefore more reliable exposure data are required. On the basis of such additional data, the flavouring substance should be reconsidered using the Procedure. Subsequently, additional data might become necessary. No relevant data on toxicity are available for the candidate substance or the three supporting substances. The only toxicity data available is a 28-day study which is not considered sufficient to evaluate chronic effects of the substance. Accordingly, additional data are required for the candidate substance. According to the practice of the Panel, a minimum requirement to provide an adequate NOAEL for flavourings in the Procedure is a 90-day study. In order to determine whether the conclusion for the candidate substance can be applied to the material of commerce, it is necessary to consider the available specifications. Adequate specifications including complete purity criteria and identity for the material of commerce have been provided for the flavouring substance. In conclusion, for the candidate substance spilanthol [FL-no: 16.121] additional data on chemical defined material are required as a 28 day study is not considered sufficient to deriving a NOAEL.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 308 (FGE.308): Glucose Pentaacetate and Sucrose Octaacetate

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate sodium diacetate [FL-no: 16.073] in the Flavouring Group Evaluation 309, using the Procedure in Commission Regulation (EC) No 1565/2000. However, although in principle it would be possible to evaluate sodium diacetate via the Procedure, the Panel considered that this is not necessary, since the substance and its dissociation products are covered by the group ADI for acetic acid and sodium acetate, including sodium diacetate, derived by the Scientific Committee on Food. Based on this group ADI, the use as sodium diacetate as a flavouring substance at the current levels of dietary intake raises no safety concern.

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 309 (FGE.309): Sodium Diacetate

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate sodium diacetate [FL-no: 16.073] in the Flavouring Group Evaluation 309, using the Procedure in Commission Regulation (EC) No 1565/2000. However, although in principle it would be possible to evaluate sodium diacetate via the Procedure, the Panel considered that this is not necessary, since the substance and its dissociation products are covered by the group ADI for acetic acid and sodium acetate, including sodium diacetate, derived by the Scientific Committee on Food. Based on this group ADI, the use as sodium diacetate as a flavouring substance at the current levels of dietary intake raises no safety concern.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 30, Revision 1 (FGE.30Rev1): 4-Prop-1-enylphenol and 2-methoxy-4-(prop-1enyl)phenyl 3-methylbutyrate from chemical group 17

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate two flavouring substances in the Flavouring Group Evaluation 30, Revision 1, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The two substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the two substances [FL-no: 04.097, 09.894] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. For [FL-no: 09.894] the composition of the stereoisomeric mixture needs to been specified.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 41
Publication date: 2011

EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 310 (FGE.310): Rebaudioside A from chemical group 30

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate rebaudioside A [FL-no: 16.113], a steviol glycoside. The substance was not considered to have genotoxic potential. Since a comprehensive and adequate toxicological database, including human studies, is available for steviol glycosides, the Panel based its evaluation of rebaudioside A on a comparison of the ADI of 4 mg/kg bw, expressed as steviol, established by EFSA, with the estimated dietary exposure figures based on the MSDI and mTAMDI approaches. The Panel concluded that rebaudioside A [FL-no: 16.113] would not give rise to safety concerns at the estimated level of intake arising from its use as flavouring substance.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 3, Revision 2 (FGE.03Rev2): Acetals of branched- and straight-chain aliphatic saturated primary alcohols and branched- and straight-chain saturated or unsaturated aldehydes, an ester of a hemiacetal and an orthoester of formic acid, from chemical groups 1, 2 and 4

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate one flavouring substance, acetaldehyde ethyl isopropyl acetal [FL-no: 06.137], structurally related to the 58 flavouring substances in the Flavouring Group Evaluation 03, in a Revision 2, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The new substance was along with the remaining 58 substances evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded as for the other already evaluated substances that the substance [FL-no: 06.137] do not give rise to safety concern at its level of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of this flavouring substance, the specifications for the materials of commerce have also been considered, and since the publication of FGE.03Rev1 additional information on chirality on 30 substances is made available and has been incorporated into the present Revision 2 of FGE.03.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 65
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: EFSA Journal
Number: 2312
Main Research Area: Technical/natural sciences
Electronic versions:
prod11320246432216.FGE.03rev2.pdf
DOIs:
10.2903/j.efsa.2011.2312
Links:
Source: orbit
Source-ID: 286612
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 50, Revision 1 (FGE.50Rev1): Consideration of pyrazine derivatives evaluated by JECFA (57th meeting) structurally related to pyrazine derivatives evaluated by EFSA in FGE.17Rev2 (2010)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. Since the previous version of FGE.50, new in vitro and in vivo genotoxicity data on 5-methylquinoxaline [FL-no: 14.028] have been provided. The Panel concluded that these data allowed to rule out genotoxicity concerns for the substance. 5-Methylquinonoxaline was then evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the substance do not give rise to safety concerns at the levels of dietary intake, estimated on the basis of the MSDI approach. So in total, for all the 41 JECFA evaluated pyrazines derivatives [FL-no: 14.005, 14.006, 14.015, 14.017, 14.018, 14.019, 14.020, 14.021, 14.022, 14.024, 14.025, 14.026, 14.027, 14.028, 14.031, 14.032, 14.034, 14.035, 14.037, 14.043, 14.044, 14.049, 14.050, 14.053, 14.054, 14.055, 14.056, 14.062, 14.067, 14.069, 14.077, 14.077, 14.082, 14.095, 14.096, 14.098, 14.100, 14.114, 14.121, 14.123, 14.142 and 14.144] evaluated in FGE.50, the Panel agrees with the JECFA conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. Adequate specifications for the materials of commerce are available for all 41 flavouring substances.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 41
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 1921
Main Research Area: Technical/natural sciences
Electronic versions:
1921.pdf
DOIs:
10.2903/j.efsa.2011.1921
Links:
Source: orbit
Source-ID: 286725
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Panel on food contact materials, enzymes, flavourings and processing aids (CEF); Scientific Opinion on Flavouring Group Evaluation 74, Revision 1 (FGE.74Rev1): Consideration of Simple Aliphatic Sulphides and Thiols evaluated by the JECFA (53rd and 61st meeting) Structurally related to Aliphatic and Alicyclic Mono-, Di-, Tri-, and Polysulphides with or without Additional Oxygenated Functional Groups from Chemical Group 20 evaluated by EFSA in FGE.08Rev1 (2009)

The European Food Safety Authority (EFSA) asked the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (the Panel) to provide scientific advice to the Commission on the implications for human health of chemically defined flavouring substances used in or on foodstuffs in the Member States. In particular, the Panel was requested to consider the Joint FAO/WHO Expert Committee on Food Additives (the JECFA) evaluations of flavouring substances assessed since 2000, and to decide whether no further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. One of the substances evaluated by the JECFA at its 61st meeting is not in the Register (spiro[2,4-dithia-1-methyl-8-oxabicyclo(3.3.0)octane-3,3’-(1’-oxa-2’-methyl)-cyclopentane], JECFA-no: 1296). Accordingly this consideration will deal with 18 JECFA evaluated substances. The Panel concluded that the 18 substances in the JECFA flavouring group of simple aliphatic sulphides and thiols are structurally related to the group of 66 aliphatic and alicyclic mono-, di-, and polysulphides with or without additional oxygenated functional groups evaluated by EFSA in the Flavouring Group Evaluation 08, Revision 1(FGE.08Rev1). The Panel agrees with the outcome of the application of the Procedure performed by the JECFA for eight of the 18 aliphatic sulphides and thiols [FL-no: 12.179,
12.198, 12.212, 12.238, 12.239, 12.255, 12.257 and 12.291]. For two tertiary thiols, 2-methyl-4-oxopentane-2-thiol [FL-no: 12.169] and 2-mercapto-2-methylpentan-1-ol [FL-no: 12.241], the Panel concluded that they should not be evaluated through the Procedure, as they are structurally related to three tertiary thiols evaluated in FGE.08Rev1 which could not be evaluated through the Procedure due to concern with respect to genotoxicity in vitro. For the eight tri- and polysulphides [FL-no: FL-no: 12.009, 12.013, 12.020, 12.023, 12.045, 12.074, 12.155 and 12.280] the Panel did not agree with the JECFA that appropriate studies were available for deriving NOAELs, and accordingly additional data are required for these eight substances. For two substances [FL-no: 12.045 and 12.155] the JECFA evaluation is only based on MSDI values derived from production figures from the USA. EU production figures are needed in order to finalise the evaluation of these substances. For one substance use levels have been provided by the Industry. For the remaining 17 substances use levels must be provided. These are needed to calculate the mTAMDIs in order to identify those flavouring substances that need more refined exposure assessment and to finalise the evaluation. In order to determine whether the conclusion for the 18 JECFA evaluated substances can be applied to the materials of commerce, it is necessary to consider the available specifications. Adequate specifications including complete purity criteria and identity are available for 10 of the 18 JECFA evaluated substances. For seven substances [FL-no: 12.009, 12.020, 12.045, 12.169, 12.238, 12.239 and 12.291] information on secondary components and/or composition of mixture is requested. For six substances [FL-no: 12.009, 12.020, 12.023, 12.045, 12.074 and 12.155] no solubility in ethanol and/or solubility in water is available. Finally, the European production volumes are not available for [FL-no: 12.045 and 12.155]. Thus, for 10 substances [FL-no: 12.009, 12.020, 12.023, 12.045, 12.074, 12.169, 12.238, 12.239 and 12.291] the Panel has reservations (no European production volumes are available, preventing them to be evaluated using the Procedure, and/or information on specifications). For two substances [FL-no: 12.169 and 12.241] the Procedure should not be applied until adequate genotoxicity data become available and for eight substances [FL-no: 12.009, 12.013, 12.020, 12.023, 12.045, 12.074, 12.155 and 12.280] additional toxicity data are required. For the remaining five of the 18 JECFA evaluated simple aliphatic sulphides and thiols [FL-no: 12.179, 12.198, 12.212, 12.255 and 12.257] the Panel agrees with JECFA conclusion “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach.
evaluated through the Procedure, no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for eighteen substances information on specifications is lacking.

**General information**

State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 131
Publication date: 2011

**Publication information**

Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: EFSA Journal
Number: 1988
Main Research Area: Technical/natural sciences
Electronic versions:
prod1132045985672.FGE.08rev3.pdf
DOIs:
Links:
Source: orbit
Source-ID: 286723
Publication: Research - peer-review › Report – Annual report year: 2011

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present FGE.96 concerns 88 JECFA-evaluated substances from different FGEs. Common for all the 88 substances was that for none of them European production volumes were available at the time for the first consideration of the FGEs in question. As a consequence, no MSDI could be calculated for EU and accordingly the substances could not be considered by EFSA using the evaluation Procedure. Industry has now provided production volumes for these substances. Based on these newly provided production figures, MSDI values for EU have been calculated and based on these MSDI values the substances have been re-considered by the stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. In the FGEs in question, genotoxicity of the substances considered in FGE.96 has already been addressed. For none of the substances a concern for genotoxicity was identified. The Panel concluded that 87 of the substances do not give rise to safety concerns at the levels of dietary intake, estimated on the basis of the MSDI approach. However, for the substance 2-acetyl-1-ethylpyrrole [FL-no: 14.045], the Panel could not identify an appropriate NOAEL and accordingly additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for eight stereoisomeric substances [FL-no: 06.040, 08.073, 09.371, 09.780, 10.050, 13.060, 13.161 and 16.039], the stereoisomeric composition has to be specified further.
EFSA Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF); Scientific Opinion on Flavouring Group Evaluation 9, Revision 3 (FGE.09Rev3): Secondary alicyclic saturated and unsaturated alcohols, ketones and esters containing secondary alicyclic alcohols from chemical group 8 and 30, and an ester of a phenol derivative from chemical group 25

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 17 flavouring substances in the Flavouring Group Evaluation 9, Revision 3, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the 16 substances [FL-no: 02.070, 02.075, 02.135, 02.167, 06.136, 07.203, 09.154, 09.355, 09.520, 09.618, 09.621, 09.870, 09.929, 09.935 and 09.949] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining candidate substance [FL-no: 07.207] additional toxicity data are requested (further metabolism and/or toxicity studies). Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Specifications including complete purity criteria and identity for the materials of commerce have been provided for all 17 candidate substances.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 68
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

EFSA ; Scientific Opinion on Flavouring Group Evaluation 59, Revision 1 (FGE.59Rev1): Consideration of aliphatic and aromatic ethers evaluated by JECFA (61st meeting and 63rd meeting) structurally related to aliphatic, alicyclic and aromatic ethers including anisole derivatives evaluated by EFSA in FGE in FGE.23 Rev2 (2010)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 30 flavouring substances consisting of aliphatic and aromatic ethers evaluated by the JECFA. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for the 30 substances considered in this FGE and agrees with the JECFA conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. Besides the safety
assessment of these flavouring substances, the specifications for the materials of commerce have also been considered and for two substances, are information on the composition of stereoisomeric mixture lacking.

**General information**
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 32
Publication date: 2011

**Publication information**
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 2158
Main Research Area: Technical/natural sciences
Electronic versions:
2158.pdf
DOIs: 10.2903/j.efsa.2011.2158
Links:
Source: orbit
Source-ID: 286718
Publication: Research - peer-review › Report – Annual report year: 2011

**EFSA ; Scientific Opinion on Flavouring Group Evaluation 66, Revision 1 (FGE.66Rev1): Consideration of Furfuryl Alcohol and Related Flavouring Substances Evaluated by JECFA (55th meeting)**
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate 14 flavouring substances in the Revision 1 of Flavouring Group Evaluation 66, using the procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the 14 substances [FL-no: 13.001, 13.002, 13.003, 13.005, 13.018, 13.019, 13.025, 13.038, 13.057, 13.062, 13.067, 13.068, 13.073 and 13.128] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach.

**General information**
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 44
Publication date: 2011

**Publication information**
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: EFSA Journal
Number: 2314
Main Research Area: Technical/natural sciences
Electronic versions:
prod11320246332821.FGE.66rev1.pdf
DOIs: 10.2903/j.efsa.2011.2314
Links:
Source: orbit
Source-ID: 286640
Publication: Research - peer-review › Report – Annual report year: 2011
EFSA Scientific Opinion on Flavouring Group Evaluation 67, Revision 1 (FGE.67Rev.1): Consideration of 40 furan-substituted aliphatic hydrocarbons, alcohols, aldehydes, ketones, carboxylic acids and related esters, sulfides, disulfides and others evaluated by JECFA at the 65th meeting (JECFA, 2008b) and re-evaluated at the 69th meeting (JECFA, 2009c)

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 33 furan-substituted aliphatic hydrocarbons, alcohols, aldehydes, ketones, carboxylic acids and related esters, sulfides, disulfides and ethers evaluated by the JECFA. In the present version of FGE.67 eight additional substances have been included. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. For twenty-two substances [FL-no: 13.029, 13.030, 13.045, 13.052, 13.054, 13.059, 13.061, 13.066, 13.069, 13.070, 13.083, 13.101, 13.103, 13.105, 13.106, 13.107, 13.123, 13.138, 13.148, 13.163 and 13.191] a concern for genotoxicity was raised and therefore these were not evaluated using the Procedure. The Panel concluded that 8 substances [FL-no: 13.006, 13.021, 13.022, 13.023, 13.024, 13.074, 13.116 and 13.190] do not give rise to safety concerns at the levels of dietary intake, estimated on the basis of the MSDI approach. For one substance [FL-no: 13.058] additional toxicity data are requested. Besides the safety assessment of these substances, the specifications for the materials of commerce have been considered. For three substances [FL-no: 13.031, 13.045 and 13.047] data on specifications / stereoisomerism are missing.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 77
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: EFSA Journal
Number: 2315
Main Research Area: Technical/natural sciences
Electronic versions:
prod11320246391821.FGE.67rev1.pdf
DOIs:
10.2903/j.efsa.2011.2315
Links:
Source: orbit
Source-ID: 286632
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA Scientific Opinion on Flavouring Group Evaluation 78, Revision 1 (FGE.78Rev1): Consideration of aliphatic and alicyclic and aromatic hydrocarbons evaluated by JECFA (63rd meeting) structurally related to aliphatic and aromatic hydrocarbons evaluated by EFSA in FGE.25Rev2

The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 24 aliphatic, alicyclic and aromatic hydrocarbons evaluated by JECFA (65th meeting). In the previous version of FGE.78, the Panel concluded that for 13 substances no applicable NOAEL was available for the substance itself or on a structurally related compound and therefore further data were required. Additional data (long term study of toxicity, mutagenicity studies and new tonnage figure) have now become available for beta-myrcene [FL-no: 01.008] and the present revision of FGE.78, FGE.78Rev1, includes the evaluation of these data. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. Two substances [FL-no: 01.011 and 01.013] are genotoxic in vitro and potentially carcinogenic, and are therefore not evaluated using the Procedure. The Panel concluded that the nine substance [FL-no: 01.002, 01.005, 01.006, 01.010, 01.016, 01.019, 01.020, 01.045 and 01.077] do not give rise to safety concerns at the levels of dietary intake, estimated on the basis of the MSDI approach. For 13 substances [FL-no: 01.003, 01.004, 01.007, 01.008, 01.009, 01.014, 01.017, 01.018, 01.024, 01.026, 01.029, 01.040 and 01.061] additional toxicity...
data are requested. For one substance [FL-no: 01.024] EU production figure is needed to finalise the evaluation. Besides the safety assessment of these substances, the specifications for the materials of commerce have been considered. For two substances [FL-no: 01.018 and 01.061] the isomeric composition is lacking. For 14 substances [FL-no: 01.004, 01.007, 01.008, 01.009, 01.017, 01.018, 01.019, 01.020, 01.024, 01.026, 01.029, 01.040, 01.045 and 01.061] further information on the composition of mixture is requested.

**General information**
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 69
Publication date: 2011

**Publication information**
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: EFSA Journal
Number: 2178
Main Research Area: Technical/natural sciences
Electronic versions:
prod11320246183619.FGE.78rev1.pdf
DOI:
10.2903/j.efsa.2011.2178
Links:
Source: orbit
Source-ID: 286650
Publication: Research - peer-review › Report – Annual report year: 2011

**EFSA ; Scientific Opinion on Flavouring Group Evaluation 86, Revision 1 (FGE.86Rev1): Consideration of aliphatic and aromatic amines and amides evaluated by JECFA (65th meeting)**

**General information**
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 42
Publication date: 2011

**Publication information**
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English

Series: EFSA Journal
Number: 1926
Main Research Area: Technical/natural sciences
Electronic versions:
1926.pdf
DOI:
10.2903/j.efsa.2011.1926
Links:
Source: orbit
Source-ID: 286734
Publication: Research - peer-review › Report – Annual report year: 2011

**EFSA ; Scientific Opinion on Flavouring Group Evaluation 91, Revision 1 (FGE.91Rev1): Consideration of simple aliphatic and aromatic sulphides and thiols evaluated by JECFA (53rd and 68th meetings) structurally related to aliphatic and alicyclic mono-, di-, tri-, and polysulphides with or without additional oxygenated functional groups evaluated by EFSA in FGE.08Rev3 (2011)**
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of 47 simple aliphatic and aromatic sulphides and thiols evaluated by the JECFA at the 53rd meeting in 1999 and the 68th meeting in 2007. The revision is made due to consideration of two additional substances compared to previous version. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel agrees with the application of the Procedure as performed by the JECFA for 34 substances considered in this FGE and agrees with the JECFA conclusion, “No safety concern at estimated levels of intake as flavouring substances” based on the MSDI approach. Contrary to the JECFA, the Panel concluded for three substances [FL-no: 12.077, 12.108 and 12.162], which has been cleared by the JECFA at step B5 (the MSDI <1.5 μg person per day), that adequate NOAELs exist and accordingly concluded at step B4 no safety concern at the estimated level of intake. Furthermore, for the trisulphides [FL-no: 12.114 and 12.256], contrary to the JECFA, the Panel concluded that no adequate NOAEL exists and that additional toxicity data are required. For eight substances [FL-no: 12.038, 12.085, 12.137, 12.138, 12.145, 12.252, 12.259 and 12.272] the Panel decided, also contrary to the JECFA, that the Procedure could not be applied due to concern for genotoxicity. So, the Panel concluded that 37 substances do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered for the substances evaluated through the Procedure and for three substances, [FL-no: 12.274, 12.284 and 15.049], information on the composition of stereoisomeric mixture is lacking.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Number of pages: 72
Publication date: 2011

Publication information
Place of publication: Parma, Italy
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 2459
Main Research Area: Technical/natural sciences
Electronic versions:
prod11324300279895.FGE.91rev1.pdf
Source: orbit
Source-ID: 314901
Publication: Research - peer-review › Report – Annual report year: 2011

EFSA ; Scientific Opinion on Flavouring Group Evaluation 98 (FGE.98): Consideration of three ring-unsaturated delta-lactones)
The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to consider evaluations of flavouring substances assessed since 2000 by the Joint FAO/WHO Expert Committee on Food Additives (the JECFA), and to decide whether further evaluation is necessary, as laid down in Commission Regulation (EC) No 1565/2000. The present consideration concerns a group of three unsaturated delta-lactones [FL-no: 10.031, 10.037 and 10.044] previously evaluated by the JECFA at their 49th meeting in 1997. The JECFA considered that further information on the metabolism of these three substances was required and that they should be evaluated together with other substances containing alpha,beta-unsaturation and that, therefore, their evaluation should be deferred. However, the EFSA Panel has considered that these three JECFA evaluated aliphatic lactones can be hydrolysed and metabolised to innocuous products in line with the aliphatic lactones evaluated by EFSA in FGE.10Rev2. The substances were evaluated through a stepwise approach that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that all three substances do not give rise to safety concern at their levels of dietary intake, estimated on the basis of the MSDI approach.

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 30
Publication date: 2011
CD4+ T-cell activation is differentially modulated by bacteria-primed dendritic cells, but is generally down-regulated by n-3 polyunsaturated fatty acids

Appropriate activation of CD4+ T cells is fundamental for efficient initiation and progression of acquired immune responses. Here, we showed that CD4+ T-cell activation is dependent on changes in membrane n-3 polyunsaturated fatty acids (PUFAs) and is dynamically regulated by the type of signals provided by dendritic cells (DCs). Upon interaction with DCs primed by different concentrations and species of gut bacteria, CD4+ T cells were activated according to the type of DC stimulus. The levels of CD80 were found to correlate to the levels of expression of CD28 and to the proliferation of CD4+ T cells, while the presence of CD40 and CD86 on DCs inversely affected inducible costimulator (ICOS) and cytotoxic T-lymphocyte antigen-4 (CTLA-4) levels in CD4+ T cells. For all DC stimuli, cells high in n-3 PUFAs showed reduced ability to respond to CD28 stimulation, to proliferate, and to express ICOS and CTLA-4. Diminished T-cell receptor (TCR) and CD28 signalling was found to be responsible for n-3 PUFA effects. Thus, the dietary fatty acid composition influences the overall level of CD4+ T-cell activation induced by DCs, while the priming effect of the DC stimuli modulates CD80, CD86 and CD40 levels, thereby affecting and shaping activation of acquired immunity by differential regulation of proliferation and costimulatory molecule expression in CD4+ T cells.
Scientific Opinion on Flavouring Group Evaluation 01, Revision 2 (FGE.01Rev2): Branched-chain aliphatic saturated aldehydes, carboxylic acids and related esters of primary alcohols and branched-chain carboxylic acids from chemical groups 1 and 2: EFSA-Q-2009-00566

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: Larsen, J. C. (Intern), Nørby, K. K. (Intern), Beltoft, V. M. (Intern), Lund, P. (Intern), Binderup, M. (Intern)
Publication date: 2010

Publication information
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: Larsen, J. C. (Intern), Nørby, K. K. (Intern), Beltoft, V. M. (Intern), Lund, P. (Intern), Binderup, M. (Intern)
Publication date: 2010


General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2010

Scientific Opinion on Flavouring Group Evaluation 20, Revision 2 (FGE.20Rev2): Benzyl alcohols, benzaldehydes, a related acetal, benzoic acids, and related esters from chemical groups 23 and 30: EFSA-Q-2009-00906

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2010

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2010


General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: Larsen, J. C. (Intern), Nørby, K. K. (Intern), Beltoft, V. M. (Intern), Lund, P. (Intern), Binderup, M. (Intern)
Publication date: 2010

Scientific Opinion on Flavouring Group Evaluation 32 (FGE.32): Flavonoids (Flavanones and dihydrochalcones) from chemical groups 25: EFSA-Q-2008-036

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2010

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 1335
Main Research Area: Technical/natural sciences
DOIs:
10.2903/j.efsa.2010.1335
Source: orbit
Source-ID: 266831
Publication: Research - peer-review › Report – Annual report year: 2010

Scientific Opinion on Flavouring Group Evaluation 5, Revision 2 (FGE.05Rev2): Branched- and straight-chain unsaturated carboxylic acids and esters of these with aliphatic saturated alcohols from chemical groups 1, 2, 3 and 5: EFSA-Q-2009-00904

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: Larsen, J. C. (Intern), Nørby, K. K. (Intern), Beltoft, V. M. (Intern), Lund, P. (Intern), Binderup, M. (Intern)
Publication date: 2010

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 1400
Main Research Area: Technical/natural sciences
DOIs:
10.2903/j.efsa.2010.1400
Source: orbit
Source-ID: 266822
Publication: Research - peer-review › Report – Annual report year: 2010

Scientific Opinion on Flavouring Group Evaluation 62, Revision 1 (FGE.62Rev1): Consideration of aliphatic acyclic diols, triols, and related substances evaluated by JECFA (68th meeting) structurally related to aliphatic primary and secondary saturated and unsaturated alcohols, aldehydes, acetals, carboxylic acids and esters containing an additional oxygenated
Scientific Opinion on Flavouring Group Evaluation 65 (FGE.65): Consideration of sulfur-substituted furan derivatives used as flavouring agents evaluated by JECFA (59th meeting) structurally related to a subgroup of substances within the group of "Furfuryl" and furan derivatives with and without additional side-chain substituents and heteroatoms from chemical group 14 evaluated by EFSA in FGE.13Rev1 (2009): EFSA-Q-2008-032Q

Scientific Opinion on Flavouring Group Evaluation 67 (FGE.67): Consideration of 40 furan-substituted aliphatic hydrocarbons, alcohols; EFSA-Q-2008-032S
Scientific Opinion on Flavouring Group Evaluation 90 (FGE.90): Consideration of aliphatic, acyclic and alicyclic terpenoid tertiary alcohols and structurally related substances evaluated by JECFA (68th meeting) structurally related to aliphatic, alicyclic and aromatic saturated and unsaturated tertiary alcohols, aromatic tertiary alcohols and their esters evaluated by EFSA in FGE.18Rev1 (2009): Question No EFSA-Q-2009-00561


Scientific Opinion on Flavouring Group Evaluation 94: Consideration of aliphatic amines and amides evaluated in addendum to the JECFA group aliphatic and aromatic amines and amides by JECFA: EFSA-Q-2009-00560

Scientific Opinion on Flavouring Group Evaluation 95 (FGE.95): Consideration of aliphatic, linear or branched-chain saturated and unsaturated alcohols, aldehydes, acids and related esters evaluated by JECFA (69th meeting) structurally related to esters of branched- and straight-chain aliphatic saturated primary alcohols and of one secondary alcohol, and branched- and straight-chain unsaturated carboxylic acids evaluated by EFSA in FGE.05Rev1 (2008): EFSA-Q-2009-00714

Scientific Opinion on Flavouring Group Evaluation 95 (FGE.95): Consideration of aliphatic, linear or branched-chain saturated and unsaturated alcohols, aldehydes, acids and related esters evaluated by JECFA (69th meeting) structurally related to esters of branched- and straight-chain aliphatic saturated primary alcohols and of one secondary alcohol, and branched- and straight-chain unsaturated carboxylic acids evaluated by EFSA in FGE.05Rev1 (2008): EFSA-Q-2009-00714
Conjugated Linoleic Acids Reduce Body Fat in Healthy Postmenopausal Women
Isomers of conjugated linoleic acids (CLA) reduce fat mass (FM) and increase insulin sensitivity in some, but not all, murine studies. In humans, this effect is still debatable. In this study, we compared the effect of 2 CLA supplements on total and regional FM assessed by dual energy X-ray absorptiometry, changes in serum insulin and glucose concentrations, and adipose tissue (AT) gene expression in humans. In a double-blind, parallel, 16-wk intervention, we randomized 81 healthy postmenopausal women to 1) 5.5 g/d of 40/40% of cis9, trans11-CLA (c9, t11-CLA) and trans10, cis12-CLA (t10, c12-CLA) (CLA-mix); 2) cis9, trans11-CLA (c9, t11-CLA); or 3) control (olive oil). We assessed all variables before and after the intervention. The CLA-mix group had less total FM (4%) and lower-body FM (7%) than the control (P = 0.02 and <0.001, respectively). Post hoc analyses showed that serum insulin concentrations were greater in the CLA-mix group (34%) than the control group (P = 0.02) in the highest waist circumference tertile only. AT mRNA expression of glucose transporter 4, leptin, and lipoprotein lipase was lower, whereas expression of tumor necrosis factor-alpha was higher in the CLA-mix group than in the control group (P <0.04). In conclusion, a 50:50 mixture of c9, t11- and t10, c12-CLA isomers resulted in less total and lower-body FM in postmenopausal women and greater serum insulin concentrations in the highest waist circumference tertile. Future research is needed to confirm the insulin desensitizing effect of the CLA mixture and the effect on the mRNA expression of adipocyte-specific genes in humans. J. Nutr. 139: 1347-1352, 2009.
EFSA; Opinion on Flavouring Group Evaluation 16 Rev2: Question No EFSA-Q-2009-00480

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Publication date: 2009
Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 46 (FGE.46). Ammonia and two ammonium salts from chemical group 30: Question No EFSA-Q-2008-050

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2009

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 60 (FGE.60). Consideration of furfuryl alcohol and related flavouring substances evaluated by JECFA (55th meeting) structurally related to Furfuryl and furan derivatives with and without additional side chain substituents and heteroatoms evaluated by EFSA in FGE.13 (2005): Question No EFSA-Q-2008-032R

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2009

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 82 (FGE.82). Consideration of Epoxides evaluated by JECFA (65th meeting): Question No EFSA-Q-2008-06

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2009
Scientific Opinion of the Panel on Food Contact Material, Enzymes, Flavourings & Processing Aids on a request from the Commission on Flavouring Group Evaluation 217: alpha,beta-Unsaturated ketones and precursors from chemical subgroup 4.1 of FGE.19: Lactones: Question No EFSA-Q-2008-762

Scientific Opinion of the Panel on Food Contact Material, Enzymes, Flavourings & Processing Aids on a request from the Commission on Flavouring Group Evaluation 57: Consideration of two structurally related pulegone metabolites and one ester thereof evaluated by JECFA (55th meeting): Question No EFSA-Q-2008-032H

Scientific Opinion of the Panel on Food Contact Material, Enzymes, Flavourings & Processing Aids on a request from the Commission on Flavouring Group Evaluation 56: Consideration of two structurally related pulegone metabolites and one ester thereof evaluated by JECFA (55th meeting): Question No EFSA-Q-2008-032H

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Publication date: 2009

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 1169
Main Research Area: Technical/natural sciences
Links:
Source: orbit
Source-ID: 255779
Publication: Research - peer-review › Report – Annual report year: 2009


General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Publication date: 2009

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 1206
Main Research Area: Technical/natural sciences
Links:
Source: orbit
Source-ID: 255784
Publication: Research - peer-review › Report – Annual report year: 2009

Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF) on a request from the Commission on Flavouring Group Evaluation 220 alpha,beta-Unsaturated ketones and precursors from chemical subgroup 4.4 of FGE.19: 3(2H)-Furanones: Question No EFSA-Q-2009-763

General information
State: Published
Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF) on a request from the European Commission on Flavouring Group Evaluation 61 revision 1 (FGE.61rev1): Question No EFSA-Q-2009-00484

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Publication date: 2009

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 1026
Main Research Area: Technical/natural sciences
Links:
Source: orbit
Source-ID: 255751
Publication: Research - peer-review › Report – Annual report year: 2009

Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF) on Flavouring Group Evaluation 89 (FGE.89): Consideration of phenyl-substituted aliphatic tertiary alcohols and related aldehydes and esters evaluated by JECFA (63rd and 68th meetings) structurally related to aliphatic, alicyclic and aromatic saturated and unsaturated tertiary alcohols, aromatic tertiary alcohols and their esters evaluated by EFSA in FGE.18Rev1 (2009): Question No EFSA-Q-2008-309

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Publication date: 2009

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 1033
Main Research Area: Technical/natural sciences
Links:
Source: orbit
Source-ID: 255760
Publication: Research - peer-review › Report – Annual report year: 2009

Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids on a request from the Comission on Flavouring Group Evaluation 203: alpha,beta-Unsaturated aliphatic aldehydes and precursors from chemical subgroup 1.1.4 of FGE.19 with two or more conjugated double bonds and with or without additional non-conjugated double bonds: Question No EFSA-Q-2008-765

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2009

Publication information
Publisher: European Food Safety Authority
Original language: English
Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids on a request from the Commission on Flavouring Group Evaluation 210: alpha,beta-Unsaturated aliphatic aldehydes and precursors from chemical subgroup 1.1.4 of FGE.19 with two or more conjugated double bonds and with or without additional non-conjugated double bonds: Question No EFSA-Q-2008-766

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Publication date: 2009

Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids on a request from the Commission on Flavouring Group Evaluation 213: alpha,beta-Unsaturated alicyclic ketones and precursors from chemical subgroup 2.7 of FGE.19: Question No EFSA-Q-2008-768

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute, Division of Food Chemistry
Authors: EFSA Publication
Publication date: 2009

Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids on a request from the Commission on FGE54rev1 Consideration of benzyl derivatives evaluated by JECFA (57th meeting) structurally related to benzyl alcohols, benzaldehydes, a related acetal, benzoic acids and related esters evaluated by EFSA in FGE.20Rev1 (2009): Question No EFSA-Q-2009-00483

General information
State: Published

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication, Binderup, M. (Intern)
Publication date: 2009


General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Publication date: 2009
An oil mixture with trans-10, cis-12 conjugated linoleic acid increases markers of inflammation and in vivo lipid peroxidation compared with cis-9, trans-11 conjugated linoleic acid in postmenopausal women

A mixture of trans-10, cis-12 (t10,c12) and cis-9, trans-11 (c9, t11) conjugated linoleic acid (CLA mixture) reduced atherosclerosis in animals, thus the effect of these isomers on endothelial dysfunctions leading to inflammation and atherosclerosis is of interest. We gave 75 healthy postmenopausal women a daily supplement of 5.5 g of oil rich in either CLA mixture, an oil rich in the naturally occurring c9,t11 CLA (CLA milk), respectively, or olive oil for 16 wk in a double-blind, randomized, parallel intervention study. We sampled blood and urine before and after the intervention. The ratios of total cholesterol:HDL cholesterol and concentrations of C-reactive protein, fibrinogen, and plasminogen activator inhibitor-1 were significantly higher in women supplemented with the CLA mixture than in those supplemented with CLA milk. Plasma triacylglycerol was significantly higher and HDL cholesterol was lower in women supplemented with the CLA mixture than with olive oil. Both CLA supplements increased lipid peroxidation, a marker of in vivo oxidative stress measured as urinary free 8-iso-prostaglandin F-2 alpha. However, the CLA mixture increased lipid peroxidation more than the CLA milk did. The plasma cytokines interleukin-6 and tumor necrosis factor-a were not affected by the treatments, nor were any of the other variables measured. In conclusion, oil containing trans-10,cis-12 CLA has several adverse effects on classical and novel markers of coronary vascular disease, whereas the c9, t11 CLA isomer is more neutral, except for a small but significant increase in lipid peroxidation compared with olive oil.
Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials In contact with Food (AFC), Flavouring Group Evaluation 34: One tetrahydroquinoline derivative from chemical group 28: Question No EFSA-Q-2008-038

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 20
Publication date: 2008
Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials In Contact with Food (AFC) on a request from the European Commission on Flavouring Group Evaluation 36, (FGE.36) Two triterpene glycosides from the priority list: EFSA-Q-2003-172C

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 19
Publication date: 2008

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials In Contact with Food (AFC) on a request from the European Commission on Flavouring Group Evaluation 4: 2-Ethylhexyl derivatives from chemical group 2: Question No EFSA-Q-2003-147

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 46
Publication date: 2008

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials In Contact with Food, Flavouring Group Evaluation 33: Six Tetrahydrofuran Derivatives From Chemical Groups 13, 14, 16 and 26: Question No EFSA-Q-2008-037

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 37
Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 47, (FGE.47) Bicyclic secondary alcohols, ketones and related esters from chemical group 8: Question No EFSA-Q-2008-051

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 39
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 813
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235742
Publication: Research - peer-review › Report – Annual report year: 2008


General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 25
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 797
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235752
Publication: Research - peer-review › Report – Annual report year: 2008

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 49, (FGE.49) Xanthin alkaloids from the Priority list from chemical group 30: Question No EFSA-Q-2003-172D

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 38
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 743
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235748
Publication: Research - peer-review › Report – Annual report year: 2008
Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 51, (FGE.51): EFSA-Q-2008-032B

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 56 (FGE.56) Consideration of monocyclic and alcohols, ketones and related esters evaluated by JECFA (63rd meeting) structurally related to secondary alicyclic saturated and unsaturated alcohols, ketones and esters containing secondary alicyclic alcohols and an ester of a phenol carboxylic acid evaluated by EFSA in FGE.09Rev1 (2008): Question EFSA-Q-2008-032G

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 56 (FGE.56) Consideration of monocyclic and alcohols, ketones and related esters evaluated by JECFA (63rd meeting) structurally related to secondary alicyclic saturated and unsaturated alcohols, ketones and esters containing secondary alicyclic alcohols and an ester of a phenol carboxylic acid evaluated by EFSA in FGE.09Rev1 (2008): Question EFSA-Q-2008-032G
Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 69, (FGE.69) Aromatic substituted secondary alcohols, ketones and related esters: EFSA-Q-2008-053

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 35
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Number: 869
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235803
Publication: Research - peer-review › Report – Annual report year: 2008

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 73, (FGE.73) alicyclic primary alcohols, aldehydes, acids and related esters: EFSA-Q-2008-057

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 19
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Number: 868
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235804
Publication: Research - peer-review › Report – Annual report year: 2008

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 76, (FGE.76) sulphur-containing heterocyclic compounds evaluated by JECFA (59th meeting): EFSA-Q-2008-060

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 36
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English

Series: The EFSA Journal
Number: 875
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235810
Publication: Research - peer-review › Report – Annual report year: 2008
Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 84, (FGE.84) Anthranilate derivatives: EFSA-Q-2008-068

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 24
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 856
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235675
Publication: Research - peer-review › Report – Annual report year: 2008

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 86, (FGE.86) Consideration of aliphatic and aromatic amines and amides evaluated by JECFA: Question No EFSA-Q-2008-070

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 46
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 745
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235671
Publication: Research - peer-review › Report – Annual report year: 2008

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Materials in Contact with Food on a request from Commission on Flavouring Group Evaluation 87, (FGE.87) bicyclic secondary alcohols, ketones and related esters: EFSA-Q-2008-071

General information
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 2
Publication date: 2008

Publication information
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 746

**General information**
State: Published
Organisations: Division of Toxicology and Risk Assessment, National Food Institute
Authors: EFSA Publication
Number of pages: 18
Publication date: 2008

**Publication information**
Publisher: European Food Safety Authority
Original language: English
Series: The EFSA Journal
Number: 857
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235668
Publication: Research - peer-review › Report – Annual report year: 2008

The potential of gut bacteria-matured DCs to activate CD4+ T cells highly depends on the lipid composition of the T cell membrane

**General information**
State: Published
Organisations: Center for Biological Sequence Analysis, Department of Systems Biology
Authors: Pedersen, S. B. (Intern), Lund, P. (Intern), Kjær, T. (Intern), Straarup, E. M. (Intern), Hellgren, L. (Intern), Frøkiær, H. (Intern)
Publication date: 2007

**Publication information**
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 199067
Publication: Research › Sound/Visual production (digital) – Annual report year: 2007

The potential of gut bacteria-matured DCs to activate CD4+T cells highly depends on the lipid composition of the T cell membrane

**General information**
State: Published
Organisations: Department of Systems Biology, Center for Biological Sequence Analysis
Authors: Pedersen, S. B. (Intern), Lund, P. (Intern), Kjær, T. (Intern), Straarup, E. M. (Intern), Hellgren, L. (Intern), Frøkiær, H. (Intern)
Pages: 65-65
Publication date: 2007

**Publication information**
Journal: Annals of Nutrition and Metabolism
Volume: 51
Issue number: Suppl. 1
Effects of dietary fatty acids on T-cell responses induced by dendritic cells

General information
State: Published
Organisations: Department of Systems Biology
Authors: Pedersen, S. B. (Intern), Kjær, T. (Intern), Lund, P. (Intern), Straarup, E. M. (Intern), Hellgren, L. (Intern), Frøkiær, H. (Intern)
Publication date: 2006
Event: Poster session presented at LMC International Food Congress 2006, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 199054
Publication: Research - peer-review › Poster – Annual report year: 2006

Incorporation of conjugated linoleic acid and vaccenic acid into lipids from rat tissues and plasma

The objective of this study was to determine the incorporation of conjugated linoleic acid (CLA) into triacylglycerols (TAG) and phospholipids (PL) of tissues and plasma, and to interpret the role of dietary-derived vaccenic acid (VA) in increasing the tissue content of CLA (c9,t11) and the influence on the fatty acid profile. We fed five groups of rats semi-purified diets with varying levels of CLA and VA: control butter with low CLA (c9,t11) and VA; control butter added 5% CLA (c9,t11); control butter added 5% Tonalin [equal amount of CLA (c9,t11) and CLA (t10,c12)]; control butter added 5% VA; butter with high CLA (c9,t11) and VA (H-CLA), for 3 weeks. The highest incorporation of CLA (c9,t11) was found in adipose tissue, and the lowest was observed in liver. Low intake of CLA (c9,t11) combined with high intake of VA resulted in a higher incorporation of CLA (c9,t11) in tissues due to the conversion of VA to CLA (c9,t11), compared to feeding CLA (c9,t11) without VA. However, in enterocytes, the proportion of CLA (c9,t11) was low after feeding VA, indicating no or only a minor conversion of VA to CLA (c9,t11) in the intestine. The incorporation of CLA (t10,c12) into TAG from plasma and tissues was generally much lower than that of the CLA (c9,t11) isomer, except in the enterocyte TAG, which had similar proportions of the two isomers.

General information
State: Published
Organisations: Department of Systems Biology, Danish Institute of Agricultural Sciences
Authors: Lund, P. (Intern), Sejrsen, K. (Ekstern), Straarup, E. M. (Intern)
Pages: 991-998
Publication date: 2006
Main Research Area: Technical/natural sciences

Publication information
Journal: European Journal of Lipid Science and Technology
Volume: 108
Issue number: 12
ISSN (Print): 1438-7697
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.06 SJR 0.71 SNIP 1.024
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.642 SNIP 0.881 CiteScore 1.85
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.737 SNIP 1.051 CiteScore 1.98
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.852 SNIP 1.124 CiteScore 2.16
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.873 SNIP 1.207 CiteScore 2.06
The composition of polyunsaturated fatty acids in erythrocytes of lactating mothers and their infants

Long-chain polyunsaturated fatty acids (LCPUFA) in breast milk, specifically docosahexaenoic acid (DHA), are important for infant brain development. Accretion of DHA in the infant brain is dependent on DHA-status, intake and metabolism. The aim of this study was to describe changes in maternal and infant erythrocyte (RBC) DHA-status during the first four months of lactation. We examined 17 mothers and their term infants at 1, 2 and 4 months of age. Milk samples and RBC from the mothers and infants were obtained and analysed for fatty acid composition. Comparative analysis of the results showed that the content of DHA in maternal RBC-phosphatidylcholine (PE) decreased over the four month period and this was not accompanied by a decrease in DHA in infant RBC-PE (P = 0.005). The ratio of n-6 PUFA to n-3 PUFA increased over time in maternal RBC-PE, but not in infant RBC-PE (P < 0.001). The level of 22:5n-6 and the ratio of LCPUFA to precursor PUFAs in infant RBC was higher than in maternal RBC phospholipids. (P = and P < 0.001 respectively). We found a decrease in the level of LCPUFA in milk, specifically AA. However, we did not observe a significant decrease in milk DHA, which may have been due to two outliers. These results indicate better DHA-status and a higher n-3/n-6 PUFA in RBC of infants than in mothers. Whether these differences reflect preferential n-3 PUFA transfer via breast milk or differences in PUFA-metabolism and utilization remains to be shown.

General information
State: Published
Organisations: Department of Systems Biology
Authors: Jørgensen, M. (Ekstern), Nielsen, P. (Ekstern), Michaelsen, K. (Ekstern), Lund, P. (Intern), Lauritzen, L. (Ekstern)
Pages: 29-39
Publication date: 2006
Effect of dietary fatty acids on the postprandial fatty acid composition of triacylglycerol-rich lipoproteins in healthy male subjects

Objective: The aim of the present study was to investigate the effect of trans-18: 1 isomers compared to other fatty acids, especially saturates, on the postprandial fatty acid composition of triacylglycerols (TAG) in chylomicrons and VLDL.  
Design: A randomised crossover experiment where five interesterified test fats with equal amounts of palmitic acid (P fat), stearic acid (S fat), trans-18: 1 isomers (T fat), oleic acid (O fat), or linoleic acid (L fat) were tested. Subjects: A total of 16 healthy, normolipidaemic males (age 23 +/- 2 y) were recruited. Interventions: The participants ingested fat-rich test meals (1 g fat per kg body weight) and the fatty acid profiles of chylomicron and VLDL TAG were followed for 8 h.  
Results: The postprandial fatty acid composition of chylomicron TAG resembled that of the ingested fats. The fatty acids in chylomicron TAG were randomly distributed among the three positions in accordance with the distributions in test fats. Calculations of postprandial TAG concentrations from fatty acid data revealed increasing amounts up to 4 h but lower response curves (IAUC) for the two saturated fats in accordance with previous published data. The T fat gave results comparable to the O and L fats. The test fatty acids were much less reflected in VLDL TAG and there was no dietary influence on the response curves. Conclusions: The fatty acid composition in the test fats as well as the positional distributions of these were maintained in the chylomicrons. No specific clearing of chylomicron TAG was observed in relation to time. Sponsorship: Danish Research Development Program for Food Technology.
Effect of silage type and energy concentration on conjugated linoleic acid (CLA) in milk fat from dairy cows

40 lactating cows were fed either clovergrass or maize silage and a low or high dietary energy concentration in a 2x2 factorial design. The maize silage diets rich in starch and linoleic acid resulted in a higher content of c9t11 and t10c12 CLA in milk fat than the grass silage diets. A high energy concentration plus maize silage led to a pronounced shift in the biohydrogenation pathway of linoleic acid, the highest t10c12 CLA content and lowest milk fat percentage. Energy concentration had no effect on milk fat CLA content or milk fat percentage in grass silage fed cows.

General information
State: Published
Organisations: Enzyme and Protein Chemistry, Department of Systems Biology
Authors: Nielsen, T. (Ekstern), Sejrsen, K. (Ekstern), Andersen, H. (Ekstern), Lund, P. (Intern), Straarup, E. M. (Intern)
Pages: 697-700
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Animal and Feed Sciences
Volume: 13
ISSN (Print): 1230-1388
Ratings:
  BFI (2018): BFI-level 1
  BFI (2017): BFI-level 1
  Web of Science (2017): Indexed Yes
  BFI (2016): BFI-level 1
  Scopus rating (2016): SJR 0.385 SNIP 0.834 CiteScore 0.9
  BFI (2015): BFI-level 1
  Scopus rating (2015): SJR 0.408 SNIP 0.797 CiteScore 0.78
  BFI (2014): BFI-level 1
  Scopus rating (2014): SJR 0.388 SNIP 0.681 CiteScore 0.63
  BFI (2013): BFI-level 1
  Scopus rating (2013): SJR 0.313 SNIP 0.478 CiteScore 0.6
  ISI indexed (2013): ISI indexed yes
  BFI (2012): BFI-level 1
  Scopus rating (2012): SJR 0.377 SNIP 0.628 CiteScore 0.8
  ISI indexed (2012): ISI indexed yes
  BFI (2011): BFI-level 1
  Scopus rating (2011): SJR 0.382 SNIP 0.686 CiteScore 0.87
  ISI indexed (2011): ISI indexed yes
  BFI (2010): BFI-level 1
  Scopus rating (2010): SJR 0.292 SNIP 0.56
  BFI (2009): BFI-level 1
  Scopus rating (2009): SJR 0.309 SNIP 0.521
  BFI (2008): BFI-level 1
Effects of medium-chain fatty acids and oleic acid on blood lipids, lipoproteins, glucose, insulin, and lipid transfer protein activities

Background: Dietary medium-chain fatty acids (MCFAs) are of nutritional interest because they are more easily absorbed from dietary medium-chain triacylglycerols (MCTs) than are long-chain fatty acids from, for example, vegetable oils. It has generally been claimed that MCFAs do not increase plasma cholesterol, although this claim is poorly documented.

Objective: We compared the effects of a diet rich in either MCFAs or oleic acid on fasting blood lipids, lipoproteins, glucose, insulin, and lipid transfer protein activities in healthy men. Design: In a study with a double-blind, randomized, crossover design, 17 healthy young men replaced part of their habitual dietary fat intake with 70 g MCTs (66% 8:0 and 34% 10:0) or high-oleic sunflower oil (89.4% 18:1). Each intervention period lasted 21 d, and the 2 periods were separated by a washout period of 2 wk. Blood samples were taken before and after the intervention periods. Results: Compared with the intake of high-oleic sunflower oil, MCT intake resulted in 11% higher plasma total cholesterol (P = 0.0005), 12% higher LDL cholesterol (P = 0.0001), 32% higher VLDL cholesterol (P = 0.080), a 12% higher ratio of LDL to HDL cholesterol (P = 0.002), 22% higher plasma total triacylglycerol (P = 0.0361), and higher plasma glucose (P = 0.033). Plasma HDL-cholesterol and insulin concentrations and activities of cholesterol ester transfer protein and phospholipid transfer protein did not differ significantly between the diets. Conclusions: Compared with fat high in oleic acid, MCT fat unfavorably affected lipid profiles in healthy young men by increasing plasma LDL cholesterol and triacylglycerol. No changes in the activities of phospholipid transfer protein and cholesterol ester transfer protein were evident.

General information
State: Published
Organisations: Department of Systems Biology
Authors: Tholstrup, T. (Ekstern), Ehnholm, C. (Ekstern), Jauhiainen, M. (Ekstern), Petersen, M. (Ekstern), Høy, C. (Intern), Lund, P. (Intern), Sandstrøm, B. (Ekstern)
Pages: 564-569
Publication date: 2004
Main Research Area: Technical/natural sciences

Publication information
Journal: American Journal of Clinical Nutrition
Volume: 79
Issue number: 4
ISSN (Print): 0002-9165
Ratings:
BFI (2018): BFI-level 2
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.97 SJR 3.664 SNIP 2.355
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 4.06 SNIP 2.379 CiteScore 5.87
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Changes in volatile compounds from sliced Havarti cheese during storage analyzed by dynamic headspace GC/MS
Sliced Havarti cheese in retail packages with modified atmosphere were stored at 5°C for up to 21 days exposed to light or protected against light. The changes in the volatile profile of the cheese was determined by dynamic headspace GC/MS. Fifty-seven compounds (aldehydes, alcohols, ketones, esters, lactones, and hydrocarbons) were identified and their relative abundance was followed during storage. The complete data set of volatiles of all Havarti cheeses was subjected to partial least squares regression (PLSR) analyses. During storage an increase in the content of some of the volatiles was observed. For Havarti cheeses exposed to light increasing levels of octane, 1-pentanol, nonanal, and tridecane were observed.

General information
State: Published
Organisations: Enzyme and Protein Chemistry, Department of Systems Biology
Authors: Lund, P. (Intern), Sørensen, J. (Ekstern), Hansen, L. (Ekstern), Hølmer, G. K. (Intern)
Development of volatile compounds in processed cheese during storage

The purpose of this work teas to study tire impact of storage conditions, such as light and temperature, on the development of volatile compounds to processed cheese. Cheese in glass containers was stored at 5, 20 or 37 degreesC in light or darkness for up to 1 yr. Dynamic headspace and gas chromatography/mass spectrometry leas used for quantifying 28 volatile organic compounds at eight stages during tree storage period. Through principal component analysis, three important storage parameters could be identified. Principal components 1, 2 and 3 reflected storage tinge, conditions of light/darkness and storage temperature, respectively, and described 81, 8 and 4% of the total variance. All compound developments were shown to correlate positively with storage time. Storage in light-resulted in a sharp rise not
only in the concentration of especially octane, but also hexanal, heptanal, octanal and nonanal, compared to storage in the
darkness. Rising temperature especially increased the concentrations of 2-propyl-1-pentanol, 2-hexanone, 2-octanone, 2-
decanone, 2-tridecanone, octanal, nonanal and decanal.

**General information**

**State:** Published

**Organisations:** Food Biotechnology and Engineering Group, Department of Systems Biology, Enzyme and Protein
Chemistry

**Authors:** Sunesen, L. O. (Intern), Lund, P. (Intern), Sørensen, J. (Ekstern), Hølmer, G. K. (Intern)

**Pages:** 128-134

**Publication date:** 2002

**Main Research Area:** Technical/natural sciences

**Publication information**

**Journal:** Lebensmittel-Wissenschaft Und-Technologie-Food Science and Technology

**Volume:** 35

**Issue number:** 2

**ISSN (Print):** 0023-6438

**Ratings:**

BFI (2018): BFI-level 1

BFI (2017): BFI-level 1

Web of Science (2017): Indexed Yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 3.31

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): CiteScore 3.11

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): CiteScore 3.12

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1

Scopus rating (2013): CiteScore 3.11

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

BFI (2012): BFI-level 1

Scopus rating (2012): CiteScore 3.12

ISI indexed (2012): ISI indexed yes

BFI (2011): BFI-level 1

Scopus rating (2011): CiteScore 3.18

ISI indexed (2011): ISI indexed yes

Web of Science (2011): Indexed yes

BFI (2010): BFI-level 1

BFI (2009): BFI-level 1

BFI (2008): BFI-level 2

Web of Science (2008): Indexed yes

Web of Science (2005): Indexed yes

Web of Science (2004): Indexed yes

Web of Science (2003): Indexed yes

Web of Science (2002): Indexed yes

Web of Science (2001): Indexed yes

Web of Science (2000): Indexed yes

Original language: English

Source: orbit

Source-ID: 46062

Publication: Research - peer-review › Journal article – Annual report year: 2002
Characterization of volatiles from cultured dairy spreads during storage by dynamic headspace GC/MS

The effect of storage time and storage temperature on the formation of volatile compounds in dairy spreads was investigated. Dairy spreads were stored for 10 weeks at -18, 5 and 20 degreesC, respectively, and analyzed after 0, 38, 54 and 67 days of storage. By means of a dynamic headspace GC/MS method using Tenax traps the dairy spreads were analyzed for volatile aromatic compounds. 61 components were identified and their relative content was followed during the storage period. Among these were four alcohols, 17 aldehydes, four esters, ten alkanes, 11 ketones and six lactones. A general increase in the concentration of most of the volatile compounds during storage was found. The content of volatile compounds in dairy spreads stored at -18 OC was nearly constant or showed a rather low increase in the content during the storage period. Storage at higher temperatures (5 and 20 degreesC) resulted in an increase in the content of most of the volatiles after 40 days of storage. The profiles obtained were subjected to multivariate data analysis to determine the volatiles potentially responsible for oxidized off-flavors in dairy spread. The volatiles were divided into three groups: one correlated with storage temperature and 5 OC, one with storage time and 20 degreesC and the last with storage time alone. Most of the volatiles were found in the highest concentration after storage at 20 OC, but the content of some volatiles was highest after storage at 5 degreesC.

General information
State: Published
Organisations: Enzyme and Protein Chemistry, Department of Systems Biology
Authors: Lund, P. (Intern), Hølmer, G. K. (Intern)
Pages: 636-642
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Journal: European Food Research and Technology
Volume: 212
Issue number: 6
ISSN (Print): 1438-2377
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.742 SNIP 0.882 CiteScore 1.81
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.732 SNIP 0.822 CiteScore 1.55
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.828 SNIP 0.908 CiteScore 1.71
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.791 SNIP 0.901 CiteScore 1.71
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.872 SNIP 1.038 CiteScore 1.68
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.009 SNIP 1.097 CiteScore 1.87
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.931 SNIP 0.901
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.917 SNIP 0.845
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.852 SNIP 0.849
Web of Science (2008): Indexed yes
Effect of randomization of mixtures of butter oil and vegetable oil on absorption and lipid metabolism in rats

Background
The nutritional effect of the regiospecific distribution of fatty acids in edible fats is currently discussed due to an increased use of interesterification of fats for human consumption. However, disagreeing results have been reported which may be due to the varying composition of the dietary fats compared. Data on the fate of such lipids beyond the bloodstream is rather scarce and animal model studies are needed. Aim of the study To compare the metabolism of butter oil and mixtures of butter and rapeseed oil, native or randomized, in a model. The regiospecific fatty acid distribution present in dietary fats was followed through absorption, chylomicron formation, and deposition in adipose tissue and in different liver lipids (triacylglycerols, phospholipids, and cholesterol esters). Methods Rats were fed for 6 weeks from weaning either butter oil (BO), a butteroil-rapeseed oil mixture 65:35 w/w (BR) or a randomized mixture of BR (tBR). Half of the animals were used for organ analysis, the rest for a postprandial study with the same fats and isolation of chylomicrons. The regiospecific distribution of the fatty acids present in the dietary fats was followed during metabolism by analyses of chylomicrons, depot fat and liver lipids, using regiospecific cleavage followed by TLC separation and quantification by GC. Results Randomization of edible fat mixtures leading to equal distribution of fatty acids between TG positions is directly reflected in the composition of chylomicrons. During clearing by lipoprotein lipase this positional distribution is abolished and the regiospecific composition of triacylglycerols in adipose tissue is completely identical for BR and tBR. Chylomicron remnants, which are taken up by the liver, are correspondingly fully degraded to free fatty acids by hepatic lipase, and distribution of fatty acids in liver triacylglycerols, phospholipids and cholesterol esters are identical for the groups fed either BR or tBR. The group fed BO with a low content of linoleic acid is on the borderline of essential fatty acid-deficiency. Conclusion Randomization (interesterification) of butter oil with rapeseed oil (65:35 w/w) for use as edible fat did not have any impact on the fatty acid composition beyond the chylomicron step when compared to the native mixture.

General information
State: Published
Organisations: Enzyme and Protein Chemistry, Department of Systems Biology
Authors: Becker, C. (Ekstern), Lund, P. (Intern), Helmer, G. K. (Intern)
Pages: 1-9
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Journal: European Journal of Nutrition
Volume: 40
Issue number: 1
ISSN (Print): 1436-6207
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Lipid oxidation in fish oil enriched mayonnaise: Calcium disodium ethylenediaminetetraacetate, but not gallic acid, strongly inhibited oxidative deterioration

The antioxidative effects of gallic acid, EDTA, and extra emulsifier Panodan DATEM TR in mayonnaise enriched with 16% fish oil were investigated. EDTA reduced the formation of free radicals, lipid hydroperoxides, volatiles, and fishy and rancid off-flavors. The antioxidative effect of EDTA was attributed to its ability to chelate free metal ions and iron from egg yolk located at the oil-water interface. Gallic acid reduced the levels of both free radicals and lipid hydroperoxides but promoted slightly the oxidative flavor deterioration in mayonnaise and influenced the profile of volatiles. Gallic acid may therefore promote the decomposition of lipid hydroperoxides to volatile oxidation products. Addition of extra emulsifier reduced the lipid hydroperoxide levels but did not influence the level of free radicals or the oxidative flavor deterioration in mayonnaise; however, it appeared to alter the profile of volatiles. The effect of the emulsifier on the physical structure and rheological properties depended on the presence of antioxidants.
Oxidation in fish oil-enriched mayonnaise 4: Effect of tocopherol concentration on oxidative deterioration

General information
State: Published
Organisations: Section for Aquatic Lipids and Oxidation, National Institute of Aquatic Resources, Department of Biotechnology, Department of Systems Biology, Department of Biochemistry and Nutrition
Authors: Jacobsen, C. (Intern), Hartvigsen, K. (Intern), Lund, P. (Intern), Thomsen, M. (Ekstern), Skibsted, L. (Ekstern), Hølmer, G. K. (Intern), Adler-Nissen, J. (Intern), Meyer, A. S. (Intern)
Pages: 308-318
Publication date: 2001
Main Research Area: Technical/natural sciences

Publication information
Journal: European Food Research and Technology
Volume: 212
Issue number: 3
ISSN (Print): 1438-2377
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.742 SNIP 0.882 CiteScore 1.81
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.732 SNIP 0.822 CiteScore 1.55
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.828 SNIP 0.908 CiteScore 1.71
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.791 SNIP 0.901 CiteScore 1.71
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.872 SNIP 1.038 CiteScore 1.68
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.009 SNIP 1.097 CiteScore 1.87
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Determination of neutral lipid hydroperoxides by size exclusion HPLC with fluorometric detection. Application to fish oil enriched mayonnaises during storage

General information
State: Published
Organisations: Department of Biochemistry and Nutrition
Authors: Hartvigsen, K. (Ekstern), Hansen, L. F. (Intern), Lund, P. (Intern), Bukhave, K. (Intern), Hølmer, G. K. (Intern)
Pages: 5842-5849
Publication date: 2000
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Agricultural and Food Chemistry
Volume: 48
Issue number: 12
ISSN (Print): 0021-8561
Ratings:
BFI (2018): BFI-level 2
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.45 SJR 1.291 SNIP 1.344
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.236 SNIP 1.253 CiteScore 3.23
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Dynamic headspace gas chromatography/mass spectrometry characterization of volatiles produced in fish oil enriched mayonnaise during storage

General information
State: Published
Organisations: Department of Biochemistry and Nutrition
Authors: Hartvigsen, K. (Ekstern), Lund, P. (Intern), Hansen, L. F. (Intern), Hølmer, G. K. (Intern)
Pages: 4858-4867
Publication date: 2000
Main Research Area: Technical/natural sciences
Oxidation in fish-oil-enriched mayonnaise 2: Assessment of the efficacy of different tocopherol antioxidant systems by discriminant partial least squares regression analysis

Oxidative protection of mayonnaises with 16% fish oil was studied during cold storage (5 degrees C) after supplementation with different tocopherol systems: the ternary antioxidant system ascorbic acid, lecithin and tocopherol (A/L/T), and two commercial mixtures, an oil-soluble (Toco 70) preparation and a water-soluble (Grindox 1032) preparation. The physical structure of the fish-oil-enriched mayonnaise was manipulated by adding extra emulsifier (Panodan TR) with the purpose of investigating whether or not this affected the antioxidative activity of the tocopherol mixtures. A number of different analytical techniques HPLC high-performance liquid chromatography, gas chromatography mass spectrometry (GC-MS), sensory analysis, confocal laser scanning microscopy and rheological measurements were employed to elucidate the chemical, sensory, structural and rheological aspects of the oxidation process. Discriminant partial least squares regression was used to analyse the data obtained. The three tocopherol preparations not only affected the oxidative stability of the mayonnaises differently they also influenced the rheological and structural properties of the mayonnaises in different ways. The rheological and structural properties of the mayonnaise were also affected by the addition of extra emulsifier, but this did not influence the formation of fishy and rancid off-flavours. Addition of the A system caused the immediate formation of distinct fish; and rancid off-flavours in the fresh mayonnaises. The volatile compounds trans-2-heptenal, 3-octen-3-one, 1-octen-3-ol, trans,cis-2, 4-heptadienal, trans,trans-2,4-heptadienal, trans-2-octenal, and trans,cis-3,6-nonadienal were thought to contribute to the fishy and rancid flavours. Addition of Toco 70 did not affect the sensory perception of mayonnaise nor the development of volatile of flavour compounds as evaluated by GC-MS, but the peroxide values were slightly increased in mayonnaise containing Toco 70 as compared to the other mayonnaises. Mayonnaise with Grindox 1032 seemed to have fewer fishy and rancid off-flavours than mayonnaises without antioxidant. This flavour-protective effect of Grindox 1032 was correlated to an increase in the size of the droplet diameter of mayonnaises supplemented with Grindox 1032.

General information
State: Published
Organisations: Section for Aquatic Lipids and Oxidation, National Institute of Aquatic Resources, Department of Biotechnology, Department of Systems Biology, Department of Biochemistry and Nutrition
Pages: 242-257
Publication date: 2000
Main Research Area: Technical/natural sciences

Publication information
Journal: European Food Research and Technology
Volume: 210
Issue number: 4
ISSN (Print): 1438-2377
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.742 SNIP 0.882 CiteScore 1.81
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.732 SNIP 0.822 CiteScore 1.55
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.828 SNIP 0.908 CiteScore 1.71
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.791 SNIP 0.901 CiteScore 1.71
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.872 SNIP 1.038 CiteScore 1.68
Oxidation in fish oil-enriched mayonnaise 3: Assessment of the influence of the emulsion structure on oxidation by discriminant partial least squares regression analysis

General information
State: Published
Organisations: Section for Aquatic Lipids and Oxidation, National Institute of Aquatic Resources, Department of Biotechnology, Department of Systems Biology, Department of Biochemistry and Nutrition, Center for BioProcess Engineering, Department of Chemical and Biochemical Engineering
Authors: Jacobsen, C. (Intern), Hartvigsen, K. (Intern), Lund, P. (Intern), Thomsen, M. (Ekstern), Skibsted, L. (Ekstern), Adler-Nissen, J. (Intern), Hølmer, G. K. (Intern), Meyer, A. S. (Intern)
Pages: 86-98
Publication date: 2000
Main Research Area: Technical/natural sciences

Publication information
Journal: European Food Research and Technology
Volume: 211
ISSN (Print): 1438-2377
Ratings:
BFI (2018): BFI-level 1
Effects of butter oil blends with increased concentrations of stearic, oleic and linolenic acid on blood lipids in young adults

General information
Oxidation in fish-oil-enriched mayonnaise 1: Assessment of propyl gallate as an antioxidant by discriminant partial least squares regression analysis

General information
State: Published
Organisations: Section for Aquatic Lipids and Oxidation, National Institute of Aquatic Resources, Department of Biotechnology, Department of Systems Biology, Department of Biochemistry and Nutrition
Authors: Jacobsen, C. (Intern), Hartvigsen, K. (Intern), Lund, P. (Intern), Meyer, A. S. (Intern), Adler-Nissen, J. (Intern), Holstborg, J. (Ekstern), Hølmer, G. K. (Intern)
Pages: 13-20
Publication date: 1999
Main Research Area: Technical/natural sciences

Publication information
Journal: European Food Research and Technology
Volume: 210
ISSN (Print): 1438-2377
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.742 SNIP 0.882 CiteScore 1.81
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.732 SNIP 0.822 CiteScore 1.55
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.828 SNIP 0.908 CiteScore 1.71
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.791 SNIP 0.901 CiteScore 1.71
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.872 SNIP 1.038 CiteScore 1.68
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.009 SNIP 1.097 CiteScore 1.87
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.931 SNIP 0.901
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.917 SNIP 0.845
Web of Science (2009): Indexed yes
Effect of Formula Supplemented with Docosahexaenoic Acid and gamma-Linolenic Acid on Fatty Acid Status and Visual Acuity in Term Infants

General information
State: Published
Organisations: Department of Biochemistry and Nutrition, Royal Veterinary and Agricultural University, Umeå University
Authors: Jørgensen, M. H. (Ekstern), Hølmer, G. K. (Intern), Lund, P. (Intern), Hernell, O. (Ekstern), Michaelsen, K. F. (Ekstern)
Pages: 412-421
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Pediatric Gastroenterology and Nutrition
Volume: 26
Original language: English
Source: orbit
Source-ID: 171659
Publication: Research - peer-review › Journal article – Annual report year: 1999

Influence of moderate amounts of trans fatty acids on the formation of polyunsaturated fatty acids

General information
State: Published
Organisations: Department of Biochemistry and Nutrition
Authors: Bysted, A. (Intern), Helmer, G. K. (Intern), Lund, P. (Intern)
Pages: 225-234
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Volume: 75
Original language: English
Source: orbit
Smørfed og smørfedblandingers ernæringsmæssige betydning

General information
State: Published
Organisations: Department of Biochemistry and Nutrition, Technical University of Denmark, Royal Veterinary and Agricultural University
Authors: Lund, P. (Intern), Becker, C. C. (Ekstern), Hølmer, G. K. (Intern), Sandström, B. (Ekstern)
Pages: 155-158
Publication date: 1997
Main Research Area: Technical/natural sciences

Publication information
Journal: Mælketidende
Volume: 6
Original language: Danish
Source: orbit
Source-ID: 167229

Visual acuity and erythrocyte docosahexaenoic acid status in breast-fed and formula-fed term infants during the first four months of life

General information
State: Published
Organisations: Department of Biochemistry and Nutrition, Royal Veterinary and Agricultural University, Umeå University
Authors: Jørgensen, M. H. (Ekstern), Hernell, O. (Ekstern), Lund, P. (Intern), Hølmer, G. K. (Intern), Michaelsen, K. F. (Ekstern)
Pages: 99-105
Publication date: 1996
Main Research Area: Technical/natural sciences

Publication information
Journal: Lipids
Volume: 31
Issue number: 1
Original language: English
Source: orbit
Source-ID: 165322

Projects:

Lipid oxidation in dairy products
An important factor for the shelf life and aroma formation in dairy products is lipid oxidation. The aim of this project is to characterize minor amounts of oxidation products by using HPLC (primary oxidation products) and dynamic headspace GC/MS (secondary oxidation products) and to implement the knowledge into the production. The project is established in cooperation with the industry (MD Foods and the Danish Dairy Board). During the first part of the project the methods were optimized for the new applications. Then storage experiments with processed cheese and feta cheese were carried out. The products were stored at 5, 20 and 37 °C for up to one year, half of the processed cheeses were stored in light and the rest in darkness. The changes were followed by determination of secondary volatile products by GC/MS. A general increase in the content of volatile compounds was found during storage of the processed cheeses. The formation of some compounds (e.g. 2-hexanone and 2-heptanone) were mainly dependent of the temperature whereas others (e.g. octane, hexanal and octanal) were mainly dependent of light. These findings were confirmed by multivariate statistic evaluation. In 1999 a storage experiment on sliced Havarti cheese was performed. The influence of light on lipid oxidation was examined by analysing the volatiles produced by dynamic headspace GC/MS. Only small differences due to light exposure were observed. A general increase in the content of volatiles was found. Similar examinations, but for shorter periods and at lower temperatures, were conducted on fish oil/rapeseed oil containing dairy spreads. Another part of this project is carried out at Department of Dairy and Food Science, The Royal Veterinary and Agricultural University, where radical formation is studied.
Oxidation mechanisms in fish oil enriched emulsions

The purpose of the project is to study the oxidation mechanisms in fish oil enriched emulsions in order to develop combined emulsifier and antioxidant systems which are more efficient in protecting fish oil enriched foods against oxidation than existing antioxidant systems. Results obtained in 1999 have shown that the low pH in mayonnaise is a very important factor for the initiation of the oxidation processes in mayonnaise. This is due to the fact that iron ions are released/loosened from the egg yolk components at the oil/water interface when pH is decreased to 4, which is the normal pH in mayonnaise. The released iron promotes decomposition of peroxides to volatiles, which are responsible for the off-flavour formation in mayonnaise. The metal chelator EDTA was observed to be a very efficient antioxidant in mayonnaise due to its ability to chelate iron. A HPLC method for determination of lipid peroxides has been further optimised and is now fully operational. By the aid of GC-MS a large number of volatiles that correlate to the fishy and rancid off-flavours in oxidised mayonnaise have been identified.

National Institute of Aquatic Resources
Department of Biochemistry and Nutrition
Department of Biotechnology
Danisco Ingredients
Association of Danish Fish Meal and Fish Oil Manufacturers
Royal Veterinary and Agricultural University

Financing sources
Source: Unknown
Name of research programme: Ukendt
Amount: 3,705,000.00 Danish Kroner
Source: Unknown
Name of research programme: Ukendt
Amount: 1,851,000.00 Danish Kroner
Trans fatty acids versus saturated fatty acids in the diet. Relation to PUFA and blood lipids.

Trans fatty acids have been questioned as safe ingredients of edible fats but the most obvious replacer, saturated fatty acids, may be even more atherogenic. Trans fatty acids are present in partially hydrogenated oils and in ruminant fats. The aim of the project is to determine the most favourable composition of our dietary fats by examining the effect on blood lipid parameters known to be correlated to the development of coronary heart disease and the influence of moderate amounts of trans fatty acids on the formation of polyunsaturated fatty acids (PUFA). The project includes four different experiments. The effect of trans fatty acids on the conversion of PUFA in organ lipids (liver and heart) was studied in rats. The different trans isomers present in the dietary fats and in rat liver were further investigated at INRA, Dijon, France, by using GC-MS and FTIR-spectroscopy. The two human postprandial experiments were carried out as randomised cross over designs. The absorption of high-fat test meals and the clearing from the blood were followed during 8 hours. In the first human study the effects of five well balanced diets with specific fatty acids were compared with respect to clearing tendency as measured by amount and fatty acid composition of chylomicrons and VLDL triacylglycerols in 16 healthy males. In the second human study the influence of three typical dietary fats on lipid and hormone metabolism was examined in obese and normal weight young women. Furthermore trans fatty acid deposition in humans was studied in samples of depot fat from females. The purpose of this study was to evaluate, whether the recommendation concerning lower ingestion of trans fatty acids put forward by the Danish Nutrition Board in 1995 has been followed. Samples from 1994 and 1997 have been analyzed and compared. Ph.D. project for Anette Bysted. Maternity leave Nov 11th - May 10th 1999. Thesis submitted. To be defended in March 2000.

Department of Biochemistry and Nutrition
Royal Veterinary and Agricultural University
Period: 01/04/1995 → 30/06/1999
Number of participants: 5
Project participant:
Bysted, Anette (Intern)
Rosenberg, Marianne (Intern)
Lund, Pia (Intern)
Jensen, Janne J. Dyrsborg (Intern)

Project Manager, organisational:
Hølmer, Gunhild Kofoed (Intern)

Financing sources
Source: Unknown
Amount: 6,178,065.00 Danish Kroner

Nutritionally improved milk fat products

Saturated fatty acids are generally regarded as atherogenic and official recommendations suggest decrease of such fatty acids in edible fats. Milk fat has a high content of a number of saturated fatty acids, therefore a modification with vegetable oils has been introduced. However such mixtures may eventually pose technological problems due to different melting characteristics. The aim of the project was to study the nutritional effects of butter modification, not only with simple blending but also with interesterification, a process which may overcome the above mentioned technological problems. Enrichment with stearic acid, a saturated fatty acid supposed to have less atherogenic effect, was also studied. Young male volunteers ingested different fat mixtures and the influence on blood lipids was followed. In a parallel experiment carried out with rats the effect on vital organs has been validated. It was shown that a modification with vegetable oils improved the nutritional effect of butter, but no special effect of stearic acid was shown for the young volunteers. It might be the case for persons with high cholesterol values. The interesterification process did not influence the fatty acid composition of important organs, nor the blood lipid patterns of the young men. Ph.D. project for Claus C. Becker. Results published in the thesis: Butter oil based spreads. Thesis defended Dec. 17th 1997. Results are under publication.

Department of Biochemistry and Nutrition
Royal Veterinary and Agricultural University
Danish Dairy Board
Period: 01/10/1992 → 17/12/1997
Number of participants: 2
Project participant:
Effects of ingestion of n-3 PUFA from fish oils.
The metabolism of n-3 fatty acids from fish oil has been studied for many years in various aspects comprising absorption, tissue deposition and influence on blood lipids. A comparison of the absorption of microencapsulated fish oil with a conventional oil showed the same deposition of fatty acids in rat tissues, indicating a full availability of the microencapsulated product. This is of special importance with respect to the use in infant formulas, as it is known that fish oil fatty acids are beneficial for the development of nervous tissue and hereby the retina. In a collaboration project with Dept. Human Nutrition, RVAU, we have studied the influence of dietary EPA and DHA on visual acuity in infants, taking the deposition of these n-3 fatty acids in red blood cells as a measure of availability. Term infants were given formulas with and without fish oil fatty acids and compared with breast fed babies. The visual acuity was found significantly lower after 4 months, when DHA was omitted from the formula.