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GRAS

FLAVORING SUBSTANCES 26

26



A laboratory setting with a pipette and a beaker. The pipette is positioned at the top, with a single drop of liquid falling from its tip. Below it, a beaker is partially filled with a light-colored liquid. The background is a soft, out-of-focus gradient of light colors.

The 26th publication by the Expert Panel of the Flavor and Extract Manufacturers Association provides an update on recent progress in the consideration of flavoring ingredients generally recognized as safe under the Food Additives Amendment.

More than 50 years since the first FEMA Expert Panel began a program to assess the safety of flavor ingredients for their intended use in food, the program's primary objective remains the evaluation of whether or not substances nominated by the flavor industry can be considered "generally recognized as safe" (GRAS) for their intended use as flavor ingredients. Operating since 1960 under the authority provided by the 1958 Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act (Hallagan and Hall, 1995), the FEMA GRAS™ program continues as the longest-running and most widely recognized industry-sponsored GRAS assessment program.

The 1958 Food Additives Amendment defined a food additive as: "... any substance ... which ... may ... [become] a component or ... [affect] the characteristics of any food ... if such substance is not generally recognized, among experts qualified by scientific training and experience to evaluate its safety, as having been adequately shown through scientific procedures ... to be safe under the conditions of its intended use." With the Food Additives Amendment, Congress for the first time established a premarketing approval requirement for all substances meeting the definition of "food additive."

Excluded from consideration as food additives are substances deemed to be "generally recognized as safe" (GRAS). Such substances are not subject to mandatory review by the Food and Drug Administration (FDA), but they are subject to the requirements established by the agency and the courts for GRAS assessments (Hallagan and Hall, 1995, 2009). Congress' intent in excluding GRAS substances from the definition of "food additive" was to provide FDA with flexibility and discretion in allocating resources to food additive issues of greater safety concern.

This GRAS 26 publication includes the results of the Expert Panel's review of 51 new GRAS flavoring substances (Tables 1 and 2). In addition, the Expert Panel determined that new use levels and/or use in new food categories for 18 flavoring substances are consistent with their current GRAS status (Table 3). The Panel also describes its current operating principles regarding

FEMA GRAS LISTS

and updates/corrections to the lists published in *Food Technology*, in chronological order

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potential bias and conflict of interest issues. Also included are changes in the GRAS status of one substance recently re-evaluated by the Panel, and an update on the use of sensory evaluation data within FEMA GRAS evaluations conducted by the Panel.

Panel Statement on Conflict of Interest and Bias Protections

Addressing issues related to potential conflict of interest and bias has been an important part of the FEMA GRAS program. At the time the FEMA Expert Panel was established in 1960, there was little guidance on how to address potential bias and conflict of interest issues in the context of GRAS assessments. Subsequent years saw some clarification from the courts regarding GRAS assessments (Hallagan and Hall, 1995) but no specific guidance on conflicts of interest and bias protections from government agencies or nongovernmental organizations.

Initial conflict of interest and bias protections that were instituted by the Expert Panel at its origin included a prohibition on Expert Panel members serving as employees or consultants to FEMA member companies, conducting GRAS evaluations "blind" with the Panel not knowing the identity of the applicant, and a prohibition against applicants having contact with Expert Panel members regarding GRAS applications or activities.

The Expert Panel has continued to expand and refine its conflict of interest and bias protections over more than 50 years of operation. The following measures are currently in place to assure that Expert Panel decisions on GRAS status are fully objective and based solely on the merits of the available information.

1) The Expert Panel is self-appointed—its members are not

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- appointed by FEMA. When a member retires from the Panel, prospective Panel members' qualifications and experience are reviewed by the Expert Panel and a new member is appointed to the Panel by the remaining Panel members.
- 2) FEMA Expert Panel members are not allowed to have consulting relationships with FEMA member companies regarding anything to do with flavors in the context of the FEMA GRAS™ program.
 - 3) FEMA Expert Panel members do not prepare GRAS applications. Applications for FEMA GRAS™ assessments are prepared by the FEMA member seeking the GRAS assessment for the substance at issue.
 - 4) Companies submitting GRAS applications are not allowed to contact Expert Panel members in any way nor are

- they allowed to attend meetings during which their applications are being considered.
- 5) When evaluating GRAS applications, Expert Panel members do not know the identity of the company responsible for the application. The identity of applicant companies is maintained as confidential information by the FEMA staff even after the substance is evaluated and granted GRAS status.
 - 6) FEMA Expert Panel members conduct their reviews of GRAS applications during in-person meetings, usually three times per year and receive honoraria and reimbursement of expenses for their service whether or not they conclude that any substances are GRAS.
 - 7) The identity of the members of the Expert Panel is known to the public through regular Panel

- publications in *Food Technology*, *Food and Chemical Toxicology*, and other publicly available journals or other media.
- 8) FEMA Expert Panel members provide a declaration of their consulting and business relationships prior to each Expert Panel meeting for review and action, if necessary, by the Panel's Legal Advisor. Action may include mandated recusal at meetings during discussion of the relevant meeting agenda item.

Change in GRAS Status of 3-Acetyl-2,5-Dimethylthiophene

The FEMA GRAS status of 3-acetyl-2,5-dimethylthiophene (FEMA No. 3527) under conditions of intended use as a flavor ingredient was reviewed. The Panel concluded that additional data, including more detailed exposure information,





Corrections and Errata to Previous GRAS Publications

- Intake of Isoeugenol.** In the Safety Assessment of Isoeugenol (FEMA No. 2468) described in “GRAS Flavoring Substances 24” (Smith et al., 2009), the estimated daily per capita intake of isoeugenol as a flavoring agent in the United States was reported as 0.00002 mg/kg bw/day. The correct corresponding estimated daily per capita intake of isoeugenol as a flavoring agent in the U.S. is 0.4 mg/kg bw/day.

- Magnolol Synonym.** In Table 1 of “GRAS Flavoring Substances 24” (Smith et al., 2009), magnolia bark extract was incorrectly included as a synonym for the chemically defined substance magnolol (FEMA 4559). Magnolia bark extract is not a synonym for FEMA 4559.

- Isomeric Clarification of FEMA 4680.** In Table 1 of “GRAS Flavoring Substances 25” (Smith et al., 2011), the primary name of FEMA 4680 was incorrectly listed as 5-isopropyl-2,6-diethyl-2-methyltetrahydro-2H-pyran. The correct name of FEMA 4680 is (±)-5-isopropyl-2,6-diethyl-2-methyltetrahydro-2H-pyran, as the substance is a mixture of the (+) and (-) isomers.

- Use Levels in Tables 4 and 5.** In “GRAS Flavoring Substances 25” (Smith et al., 2011), the new use levels listed in Table 3 for FEMA 3455 contained errors in two food categories and the new use levels for FEMA 4309 were omitted from Table 3. The correct and the previously omitted new use levels for both substances, respectively, are listed in Table 4 of this current publication. The updated average usual use levels in chewing gum listed in Table 5 of “GRAS Flavoring Substances 25” (Smith et al., 2011) for several substances are corrected in Table 5 of this current publication.

comparative metabolism studies, and more comprehensive toxicity data including an in-depth evaluation of the mechanism of action for any potential adverse effects are required. Until such data are available for review, the flavor ingredient 3-acetyl-2,5-dimethylthiophene has been removed from the GRAS list. The Panel also reviewed data for related alkyl-substituted thiophene substances and confirmed that no change in the GRAS status of their uses was warranted.

Sensory Data Consideration in FEMA GRAS Evaluations

The Codex Alimentarius Guidelines for the Use of Flavourings (CAC/GL 66-2008) defines flavorings (or flavor ingredients) as products that are added to food to impart, modify,

or enhance the flavor of food¹. While not explicitly defined, flavors with modifying properties is a term that can be used to describe flavor ingredients that may not have nor impart a specific characteristic flavor of their own, but that modify or enhance the profile of a flavoring or food. Some of these flavor modifiers also display multiple characteristics, in that they have the ability to perform technical effects (e.g., as a sweetener) in food outside of their flavor modification properties. As the technical effect for all GRAS determinations made by the Panel is for flavoring, the Panel requires sensory testing to demonstrate the technical effect and functionality in food is limited to flavoring under conditions of intended use.

The format of these sensory data submissions to the Panel

and the choice of tests that are conducted by applicants for such substances have varied widely. To ensure consistency between evaluations for substances with similar intended flavor modulation effects, the Panel has requested that sensory experts within the flavor industry develop best practices for conducting and reporting sensory evaluations that will be submitted as supporting evidence for FEMA GRAS™ status under conditions of intended use. The Panel has requested that this guidance include options for the choice of tests, analysis of data, and reporting of methodology and results to provide clear input to the Panel. **FT**

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A Note of Thanks

In January 2012, Dr. Timothy B. Adams retired from his role as the Scientific Secretary to the FEMA Expert Panel. The Panel deeply appreciates the dedication and support that Dr. Adams provided over many years of service to the Panel.

NOTE

¹ From Codex Guidelines for the Use of Flavourings (CAC/GL 66-2008): “Flavourings means products that are added to food to impart, modify, or enhance the flavour of food with the exception of flavour enhancers considered as food additives under the Codex Class Names and the International Numbering System for Food Additives—CAC/GL 36-1989. Flavourings do not include substances that have an exclusively sweet, sour, or salty taste (e.g. sugar, vinegar, and table salt). Flavourings may consist of flavouring substances, natural flavouring complexes, thermal process flavourings or smoke flavourings and mixtures of them and may contain non-flavouring food ingredients within defined conditions such as carriers, solvents, etc. Flavourings are not intended to be consumed as such.”

REFERENCES

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TABLE 1. Primary Names & Synonyms

Primary names (in boldface) & Synonyms (in lightface).

FEMA NO.	SUBSTANCE PRIMARY NAME AND SYNONYMS
4728	Glucosyl steviol glycosides Stevia extract, enzymatically modified
4729	dl-Isomenthol (±)-Isomenthol Cyclohexanol, 5-methyl-2-(1-methylethyl)-, (1R,2S,5S)-rel-
4730	O-Ethyl 5-1-methoxyhexan-3-yl carbonothioate Carbonothioic acid, 5-[1-(2-methoxyethyl)butyl] O-ethyl ester
4731	Cassyrane 2-tert-Butyl-5-methyl-2-propyl-2,5-dihydrofuran (±)-cis- and (±)-trans-2-(1,1-Dimethylethyl)-2,5-dihydro-5-methyl-2-propylfuran
4732	1,5-Octadien-3-ol Octa-1,5-dien-3-ol
4733	(±)-2-Mercaptoheptan-4-ol 2-Sulfanylheptan-4-ol 2-Thioheptan-4-ol 2-Mercapto-4-heptanol
4734	3-(Methylthio)decanal 3-(Methylsulfanyl)decanal
4735	(4Z,7Z)-Trideca-4,7-dienal (4Z,7Z)-Tridecadienal cis,cis-4,7-Tridecadienal (Z,Z)-4,7-Tridecadienal
4736	Persicaria odorata oil Polygonum odoratum oil Vietnamese cilantro oil
4737	Amacha leaves extract Hydrangea macrophylla var. thunbergii extract Buddha tea extract
4738	Glutamyl-2-aminobutyric acid N-[(1S)-1-Carboxypropyl]-L-glutamine L-gamma-Glutamyl-L-2-aminobutyric acid
4739	Glutamyl-norvalyl-glycine N-(N-L-gamma-Glutamyl-L-norvalyl)-glycine L-Glutamyl-L-norvalyl-glycine
4740	Glutamyl-norvaline L-gamma-Glutamyl-L-norvaline N-(N-L-gamma-Glutamyl)-L-norvaline
4741	N1-(2,3-Dimethoxybenzyl)-N2-(2-(pyridin-2-yl)ethyl) oxalamide Ethanediamide, N1-[(2,3-dimethoxyphenyl)methyl]-N2-[2-(2-pyridinyl)ethyl]-
4742	1-(2-Hydroxy-4-methylcyclohexyl)ethanone
4743	Mexican lime oil, expressed Key lime oil, expressed Citrus medica var. acida oil, expressed Citrus aurantifolia oil, expressed
4744	Persian lime oil, expressed Tahitian lime oil, expressed Citrus latifolia oil, expressed
4745	(±)-6-Methoxy-2,6-dimethylheptanal 6-Methoxy-2,6-dimethylheptanal

FEMA NO.	SUBSTANCE PRIMARY NAMES AND SYNONYMS
4746	3,5-Undecadien-2-one Undeca-3,5-dien-2-one
4747	(±)-2,5-Undecadien-1-ol 2,5-Undecadien-1-ol Undeca-2,5-dien-1-ol
4748	Triethylthialdine 4H-1,3,5-Dithiazine, 2,4,6-triethyl-dihydro- 2,4,6-Triethyl-1,3,5-dithiazinane
4749	4-Methylpentyl 4-methylvalerate 4-Methylpentyl 4-methylpentanoate Pentanoic acid, 4-methyl-, 4-methylpentyl ester 4-Methylpentanoic acid, 4-methylpentyl ester
4750	cis-3-Hexenyl salicylate 2-Hydroxybenzoic acid 3Z-hexenyl ester (Z)-3-Hexenyl salicylate 3Z-Hexenyl 2-hydroxybenzoate
4751	(R)-N-(1-Methoxy-4-methylpentan-2-yl)-3,4-dimethylbenzamide Benzamide, N-[(1R)-1-(methoxymethyl)-3-methylbutyl]-3,4-dimethyl-
4752	N-Acetyl glutamate N-Acetyl-L-glutamic acid alpha-(N-Acetyl)-L-glutamic acid
4753	1,3-Propanediol
4754	Szechuan pepper extract Zanthoxylum bungeanum extract Zanthoxylum piperitum extract Zanthoxylum simulans extract Zanthoxylum schinifolium extract Japan Pepper extract Sichuan pepper extract
4755	Tasmannia lanceolata extract Drimys aromatica extract Drimys lanceolata extract
4756	Mentha longifolia oil Horsemint oil
4757	Mangosteen distillate Garcinia mangostana distillate
4758	Ethyl 3-(2-hydroxyphenyl)propanoate Hydrocinnamic acid, o-hydroxy-, ethyl ester Benzenepropanoic acid, 2-hydroxy-, ethyl ester Ethyl melilotate
4759	1-Cyclopropanemethyl-4-methoxybenzene Benzene, 1-(cyclopropylmethyl)-4-methoxy- 1-(Cyclopropylmethyl)-4-methoxybenzene Anisole, p-(cyclopropylmethyl)-
4760	Prenyl thioisobutyrate Propanethioic acid, 2-methyl-, 5-(3-methyl-2-buten-1-yl) ester 5-3-Methylbut-2-enyl 2-methylpropanethioate
4761	Prenyl thioisovalerate 5-3-Methylbut-2-enyl 3-methylbutanethioate Butanethioic acid, 3-methyl-, 5-(3-methyl-2-buten-1-yl) ester
4762	(-)-Matairesinol (8R,8'R)-(-)-Matairesinol 2-(3H)-Furanone, dihydro-3,4-bis[[4-(4-hydroxy-3-methoxyphenyl)methyl]-, (3R,4R)-

FEMA NO.	SUBSTANCE PRIMARY NAME AND SYNONYMS
4763	Stevioside Steviosin (4, α)-13-[(2- <i>O</i> - β -D-Glucopyranosyl- α -D-glucopyranosyl)oxy]kaur-16-en-18-oic acid β -D-glucopyranosyl ester
4764	1-(2,4-Dihydroxyphenyl)-3-(3-hydroxy-4-methoxyphenyl)propan-1-one
4765	Ethyl 5-formyloxydecanoate Decanoic acid, 5-(formyloxy)-, ethyl ester
4766	3-[3-(2-Isopropyl-5-methyl-cyclohexyl)ureido]butyric acid ethyl ester 3-[[[5-Methyl-2-(1-methylethyl)cyclohexyl]amino]carbonyl]amino]butanoic acid ethyl ester
4767	2-Isopropyl-4-methyl-3-thiazoline 2-Isopropyl-4-methyl-2,5-dihydrothiazole
4768	2,6,10-Trimethyl-9-undecenal 2,6,10-Trimethylundec-9-enal
4769	5-Mercapto-5-methyl-3-hexanone
4770	Meyer lemon oil, cold pressed, <i>Citrus x meyeri</i>
4771	Steviol glycoside extract, <i>Stevia rebaudiana</i>, Rebaudioside A 60%
4772	Steviol glycoside extract, <i>Stevia rebaudiana</i>, Rebaudioside A 80%
4773	(<i>E</i>)-<i>N</i>-[2-(1,3-Benzodioxol-5-yl)ethyl]-3-(3,4-dimethoxyphenyl)prop-2-enamide Rubescenamine
4774	4-Amino-5-(3-(isopropylamino)-2,2-dimethyl-3-oxopropoxy)-2-methylquinoline-3-carboxylic acid 3-Quinolinecarboxylic acid, 4-amino-5-[2,2-dimethyl-3-[(1-methylethyl)amino]-3-oxopropoxy]-2-methyl-
4775	3-Methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pent-4-en-2-ol Ebano 4-Penten-2-ol, 3-methyl-5-(2,2,3-trimethyl-3-cyclopenten-1-yl)-
4776	(1-Methyl-2-(1,2,2-trimethylbicyclo[3.1.0]hex-3-ylmethyl)cyclopropyl)methanol Cyclopropanemethanol, 1-methyl-2-[(1,2,2-trimethylbicyclo[3.1.0]hex-3-yl)methyl]-
4777	Erospicata oil, <i>Mentha spicata</i> 'Erospicata' <i>Mentha spicata</i> 'Erospicata' oil
4778	Curly mint oil, <i>Mentha spicata</i> var. <i>crispa</i> <i>Mentha spicata</i> var. <i>crispa</i> oil



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TABLE 2 Anticipated Average Usual Use Levels/Anticipated Average Maximum Use Levels

Anticipated Average Usual Use Levels (ppm)/Anticipated Average Maximum Use Levels (ppm) for new FEMA GRAS™ Flavoring Substances on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS).

	Glucosyl steviol glycosides	<i>dl</i> - Isomenthol	<i>O</i> -Ethyl 5- <i>l</i> -methoxyhexan-3-yl carbonothioate	Cassyrane	1,5-Octadien-3-ol	(±)-2-Mercaptoheptan-4-ol	3- (Methylthio) decanal	(4 <i>Z</i> ,7 <i>Z</i>)-Trideca-4,7-dienal	<i>Persicaria odorata</i> oil
CATEGORY	FEMA No. 4728	4729	4730	4731	4732	4733	4734	4735	4736
BAKED GOODS	150/400	30/130				0.08/0.6	0.05/0.2		1/10
BEVERAGES, NONALCOHOLIC	125/250	10/35	0.25/0.5		0.05/0.2				0.5/1
BEVERAGES, ALCOHOLIC	125/250	10/35							1/20
BREAKFAST CEREALS	200/500								0.5/1
CHEESES	100/200								1/5
CHEWING GUM	500/1,000	500/1,100		50/500		0.1/1			0.5/1
CONDIMENTS AND RELISHES	125/250						0.05/0.1		1/10
CONFECTIONS AND FROSTINGS	50/100		0.4/0.8	10/50					0.5/1
EGG PRODUCTS							0.05/0.1	0.001/0.05	1/2
FATS AND OILS	125/250					0.06/0.5	0.05/0.2	0.001/0.05	1/10
FISH PRODUCTS							0.05/0.1	0.001/0.05	1/20
FROZEN DAIRY	125/250	20/68	0.25/1						1/10
FRUIT ICES	125/250	20/68			0.1/1				1/20
GELATINS AND PUDDINGS	125/250								1/20
GRANULATED SUGAR									
GRAVIES	125/250					0.06/0.5	0.05/0.1	0.001/0.05	1/20
HARD CANDY	100/300	100/400	0.5/1	10/50		0.06/0.5			0.5/1
IMITATION DAIRY	125/250								0.5/1
INSTANT COFFEE AND TEA	125/250		0.25/5		0.1/0.5	0.06/0.5			0.5/1
JAMS AND JELLIES	150/300			10/20		0.05/0.5			0.5/1
MEAT PRODUCTS						0.06/0.5	0.05/0.1	0.001/0.05	1/20
MILK PRODUCTS	150/300		0.4/0.8		0.1/1		0.05/0.1	0.001/0.05	0.5/1
NUT PRODUCTS	200/400						0.05/0.1	0.001/0.05	0.2/1
OTHER GRAINS	100/200								0.1/5
POULTRY							0.05/0.1		1/20
PROCESSED FRUITS	150/400					0.06/0.5			0.5/1
PROCESSED VEGETABLES	100/200					0.06/0.5	0.05/0.1		
RECONSTITUTED VEGETABLES	150/300					0.06/0.5			
SEASONINGS AND FLAVORS	200/400		2/25		0.01/0.1	0.06/0.5	0.05/0.1	0.001/0.05	1/100
SNACK FOODS	150/300				0.01/0.1	0.06/0.5	0.05/0.1	0.001/0.05	1/20
SOFT CANDY	100/300		0.5/1						0.1/3
SOUPS	150/300					0.06/0.5	0.05/0.1	0.001/0.05	1/20
SUGAR SUBSTITUTES	300/800								
SWEET SAUCES	200/400		0.25/0.5			0.05/0.5			

	Amacha leaves extract	Glutamyl-2-aminobutyric acid	Glutamyl-norvalyl-glycine	Glutamyl-norvaline	N1-(2,3-Dimethoxybenzyl)-N2-(2-(pyridin-2-yl)ethyl) oxalamide	1-(2-Hydroxy-4-methylcyclohexyl)ethanone	Mexican lime oil, expressed	Persian lime oil, expressed	(±)-6-Methoxy-2,6-dimethylheptanal
CATEGORY	4737	4738	4739	4740	4741	4742	4743	4744	4745
BAKED GOODS		20/50	4/12	5/15	5/10	50/150	360/560	360/560	15/18
BEVERAGES, NONALCOHOLIC	150/350	30/60	6/18	7/21		50/150	50/80	50/80	3/6
BEVERAGES, ALCOHOLIC						50/150	400/460	400/460	
BREAKFAST CEREALS		100/200	20/40	25/50	25/50	20/50	125/200	125/200	
CHEESES		40/80	6/18	10/20	5/15	50/75			
CHEWING GUM						1,000/1,500	1,900/2,325	1,900/2,325	200/200
CONDIMENTS AND RELISHES		40/80	8/24	10/20	10/20	50/150	90/100	90/100	
CONFECTIONS AND FROSTINGS	250/350					500/1,500			
EGG PRODUCTS		20/50	4/12	5/15	5/10				
FATS AND OILS		40/80	8/24	10/20	10/20	10/75			
FISH PRODUCTS		20/50	4/12	5/15	5/15	1/10			
FROZEN DAIRY		30/60	6/18	7/21		50/150	375/475	375/475	15/19
FRUIT ICES		30/60	6/18	7/21		50/150			
GELATINS AND PUDDINGS						10/75	350/500	350/500	9/12
GRANULATED SUGAR									
GRAVIES		40/80	8/24	10/20	10/20	10/75	1/10	1/10	
HARD CANDY						50/100	350/950	350/950	6/6
IMITATION DAIRY		30/60	6/18	7/21		5/10			
INSTANT COFFEE AND TEA		15/45	2/6	3/9		5/25			
JAMS AND JELLIES						50/150			5/5
MEAT PRODUCTS		20/50	4/12	5/15	5/15		75/85	75/85	
MILK PRODUCTS	200/350	20/50	4/12	5/15					
NUT PRODUCTS					5/10				
OTHER GRAINS					5/10	5/10			
POULTRY		20/50	4/12	5/15	5/15				
PROCESSED FRUITS									
PROCESSED VEGETABLES		20/50	4/12	5/15	5/15				
RECONSTITUTED VEGETABLES		20/50	4/12	5/15	5/10				
SEASONINGS AND FLAVORS		120/240	20/40	27/54	25/50	10,000/100,000			5/5
SNACK FOODS		120/240	20/40	27/54	25/50	50/150			
SOFT CANDY						50/150	575/800	575/800	6/6
SOUPS		30/60	6/18	7/21	10/20	50/150			
SUGAR SUBSTITUTES		150/300	20/40	35/70		1/25			
SWEET SAUCES		40/80	8/24	10/20		100/1,000			

TABLE 2 CONTINUED- Anticipated Average Usual Use Levels/Anticipated Average Maximum Use Levels

Anticipated Average Usual Use Levels (ppm)/Anticipated Average Maximum Use Levels (ppm) for new FEMA GRAS™ Flavoring Substances on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS).

	3,5-Undecadien-2-one	(±)-2,5-Undecadien-1-ol	Triethylthaldine	4-Methylpentyl 4-methylvalerate	cis-3-Hexenyl salicylate	(R)-N-(1-Methoxy-4-methylpentan-2-yl)-3,4-dimethylbenzamide	N-Acetyl glutamate	1,3-Propanediol	Szechuan pepper extract
CATEGORY	4746	4747	4748	4749	4750	4751	4752	4753	4754
BAKED GOODS			0.5/1	4/30	0.3/5	2/6		1,300/1,300	100/500
BEVERAGES, NONALCOHOLIC	1/10	1/10		4/30	0.15/5		50/150	690/690	200/400
BEVERAGES, ALCOHOLIC				4/30	0.15/5			690/690	200/400
BREAKFAST CEREALS			0.5/1	4/30	0.3/5	2/6			
CHEESES			0.5/1	4/30		2/6	50/150		300/500
CHEWING GUM	10/30	5/20		10/80	0.5/5			1,800/1,800	500/2,000
CONDIMENTS AND RELISHES			0.5/1	4/30		4/10	20/100	20/20	200/400
CONFECTIONS AND FROSTINGS	1/10	1/10		4/30	0.5/5				200/400
EGG PRODUCTS						2/6			100/200
FATS AND OILS	1/10	1/20	1/2			2/8	25/100		50/300
FISH PRODUCTS						4/10	50/150		100/300
FROZEN DAIRY				4/30	0.5/5			810/810	200/300
FRUIT ICES	1/10	1/10		4/30	0.5/5			810/810	
GELATINS AND PUDDINGS	1/10			4/30	0.5/5	4/10		250/290	100/300
GRANULATED SUGAR				4/30					
GRAVIES	1/10	1/20	0.5/1			4/10	50/150		300/400
HARD CANDY	5/20	1/10		4/30	0.5/5			1,300/1,300	100/200
IMITATION DAIRY			0.5/1		0.5/5		50/150		100/200
INSTANT COFFEE AND TEA				4/30			50/150		
JAMS AND JELLIES	1/10	1/10		4/30	0.5/5				200/400
MEAT PRODUCTS			1/2			4/10	50/150		50/150
MILK PRODUCTS			0.5/1		0.5/5	2/6	50/200		100/200
NUT PRODUCTS				4/30	0.5/5	2/6			200/300
OTHER GRAINS					0.5/5	2/6			100/500
POULTRY			0.5/1			2/6	50/150		300/500
PROCESSED FRUITS				4/30	0.5/5			300/300	100/300
PROCESSED VEGETABLES			0.5/1			2/6	25/100		200/400
RECONSTITUTED VEGETABLES						2/6	25/100		
SEASONINGS AND FLAVORS	1/10	1/30	1/10	4/30	0.5/5	4/10	50/500		100/250
SNACK FOODS	5/25	1/25	1/2	4/30	0.5/5	4/10	50/200		200/400
SOFT CANDY	1/10	1/10		4/30	0.5/5			1,300/1,300	100/200
SOUPS	1/10		0.5/1			4/8	50/150	20/20	100/500
SUGAR SUBSTITUTES									
SWEET SAUCES	1/10	1/10		4/30	0.5/5		50/150	7,000/7,000	100/250

	<i>Tasmannia lanceolata</i> extract	<i>Mentha longifolia</i> oil	Mangosteen distillate	Ethyl 3-(2-hydroxyphenyl)propanoate	1-Cyclopropanemethyl-4-methoxybenzene	Prenyl thioisobutyrate	Prenyl thioisovalerate	(-)-Matairesinol	Sterioside
CATEGORY	4755	4756	4757	4758	4759	4760	4761	4762	4763
BAKED GOODS				0.05/0.2	1.2/6	0.01/0.5	0.01/0.5		40/65
BEVERAGES, NONALCOHOLIC	1/2		20/100	0.02/0.2	0.4/2	0.01/0.5	0.01/0.5	25/150	25/35
BEVERAGES, ALCOHOLIC	1/4		20/100	0.1/0.4	4/20	0.01/0.5	0.01/0.5		25/35
BREAKFAST CEREALS			20/100	0.05/0.2	1.2/8				40/65
CHEESES				0.2/0.3					
CHEWING GUM	30/40	500/10,000		2/5	4/100	0.03/1	0.03/1	50/300	200/200
CONDIMENTS AND RELISHES				0.1/0.3		0.01/0.5	0.01/0.5		15/30
CONFECTIONS AND FROSTINGS			10/60	0.1/0.3	1.8/10	0.01/0.5	0.01/0.5	25/150	
EGG PRODUCTS				0.05/0.2					
FATS AND OILS				0.5/1					
FISH PRODUCTS				0.05/0.2					
FROZEN DAIRY			40/200	0.1/0.4	1.2/8				40/55
FRUIT ICES			20/100	0.1/0.4	1.2/8				25/35
GELATINS AND PUDDINGS			40/200	0.1/0.3	1.8/10				40/65
GRANULATED SUGAR									
GRAVIES				0.05/0.3		0.01/0.5	0.01/0.5		15/30
HARD CANDY	4/7	100/2,000	20/100	0.2/0.5	1.2/8	0.01/0.5	0.01/0.5		40/65
IMITATION DAIRY				0.2/0.5					40/55
INSTANT COFFEE AND TEA								25/150	25/35
JAMS AND JELLIES				0.05/0.2		0.01/0.5	0.01/0.5		
MEAT PRODUCTS									10/20
MILK PRODUCTS				0.5/0.8				25/150	40/55
NUT PRODUCTS									
OTHER GRAINS									
POULTRY									
PROCESSED FRUITS						0.001/0.5	0.001/0.5		25/35
PROCESSED VEGETABLES						0.001/0.5	0.001/0.5		25/35
RECONSTITUTED VEGETABLES									
SEASONINGS AND FLAVORS	100/200		500/4,000	5/100		0.01/0.05	0.01/0.05		25/35
SNACK FOODS	10/20		20/100			0.01/0.05	0.01/0.05		20/30
SOFT CANDY	4/7	200/5,000	20/100	0.2/0.5	1.2/8	0.01/0.05	0.01/0.05		40/65
SOUPS				0.05/0.3		0.01/0.05	0.01/0.05		10/20
SUGAR SUBSTITUTES									
SWEET SAUCES			20/100	0.05/0.3					25/35

TABLE 2 CONTINUED- Anticipated Average Usual Use Levels/Anticipated Average Maximum Use Levels

Anticipated Average Usual Use Levels (ppm)/Anticipated Average Maximum Use Levels (ppm) for new FEMA GRAS™ Flavoring Substances on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS).

	1-(2,4-Dihydroxyphenyl)-3-(3-hydroxy-4-methoxyphenyl)propan-1-one	Ethyl 5-formylloxidecanoate	3-[3-(2-Isopropyl-5-methylcyclohexyl)ureido]butyric acid ethyl ester	2-Isopropyl-4-methyl-3-thiazoline	2,6,10-Trimethyl-9-undecenal	5-Mercapto-5-methyl-3-hexanone	Meyer lemon oil, cold pressed, Citrus x meyeri	Steviol glycoside extract, Stevia rebaudiana, Rebaudioside A 60%	Steviol glycoside extract, Stevia rebaudiana, Rebaudioside A 80%
CATEGORY	4764	4765	4766	4767	4768	4769	4770	4771	4772
BAKED GOODS		120/300		0.25/0.5	0.2/1	2.5/5	213/413	30/30	30/35
BEVERAGES, NONALCOHOLIC	20/75	5/50	0.2/1.7	0.25/0.5	0.2/1	0.1/0.5	50.7/108.7	30/30	30/35
BEVERAGES, ALCOHOLIC	25/150	5/50		0.25/0.5	0.2/1	0.3/2.5	123/174	30/30	30/35
BREAKFAST CEREALS	25/150			0.25/0.5	0.2/1	0.1/0.3	200/400	30/30	30/35
CHEESES		10/100	2/6		0.2/1	0.3/0.5	126/254		
CHEWING GUM	25/150			0.5/1	0.4/1.5	5/10	376/1,692	200/200	234/234
CONDIMENTS AND RELISHES			4/10	0.25/0.5	0.2/1	0.3/0.5	151/307	30/30	30/35
CONFECTIONS AND FROSTINGS	25/150	5/50		0.25/0.5	0.2/1	0.3/2.5	50/500	30/30	30/35
EGG PRODUCTS		5/50	4/10		0.2/1	0.3/0.5	20/200		
FATS AND OILS		100/200	2/8		0.2/1		20/20		
FISH PRODUCTS			2/8		0.2/1	0.3/0.5	19/200		
FROZEN DAIRY	25/150	120/300		0.25/0.5	0.2/1	1/10	126/254	30/30	30/35
FRUIT ICES	25/150			0.25/0.5	0.2/1	0.5/5	50/500	30/30	30/35
GELATINS AND PUDDINGS	25/150	120/300			0.2/1	0.3/2.5	109/265	30/30	30/35
GRANULATED SUGAR	25/150				0.2/1		20/100	30/30	30/35
GRAVIES	25/150	40/80	4/10		0.2/1	0.3/0.5	41/107	30/30	30/35
HARD CANDY	25/150			0.25/0.5	0.2/1	2.5/12.5	431/2,017	30/30	30/35
IMITATION DAIRY	25/150	10/100			0.2/1		126/254	30/30	30/35
INSTANT COFFEE AND TEA	25/150	5/50	0.2/1.7		0.2/1	0.1/1	20/400	30/30	30/35
JAMS AND JELLIES	25/150			0.25/0.5	0.2/1	0.5/2.5	125/200	30/30	30/35
MEAT PRODUCTS			2/8		0.2/1	0.3/0.5	19/20		
MILK PRODUCTS	25/150	10/100		0.25/0.5	0.2/1	0.1/0.5	126/254	30/30	30/35
NUT PRODUCTS		5/50			0.2/1		20/200		
OTHER GRAINS					0.2/1		20/200		
POULTRY			2/8		0.2/1	0.3/0.5	19/200		
PROCESSED FRUITS				0.25/0.5	0.2/1		125/200	30/30	30/35
PROCESSED VEGETABLES			2/8		0.2/1	0.3/0.5	125/200	30/30	30/35
RECONSTITUTED VEGETABLES			2/8		0.2/1		125/200	30/30	30/35
SEASONINGS AND FLAVORS		5/50	10/20	0.25/0.5	0.2/1	0.3/0.5	50/500	30/30	30/35
SNACK FOODS	25/150		8/20		0.2/1	0.3/0.5	50/300	30/30	30/35
SOFT CANDY	25/150	100/200		0.25/0.5	0.2/1	0.5/2.5	232.1/456.7	30/30	30/35
SOUPS		5/50	4/10		0.2/1	0.3/0.5	5.5/100	30/30	30/35
SUGAR SUBSTITUTES					0.2/1		20/100	30/30	30/35
SWEET SAUCES	25/150	1/2		0.25/0.5	0.2/1	0.3/0.5	50/200	30/30	30/35

	(E)-N-[2-(1,3-Benzodioxol-5-yl)ethyl]-3-(3,4-dimethoxyphenyl)prop-2-enamide	4-Amino-5-(3-(isopropylamino)-2,2-dimethyl-3-oxopropoxy)-2-methylquinoline-3-carboxylic acid	3-Methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pent-4-en-2-ol	(1-Methyl-2-(1,2,2-trimethylcyclo[3.1.0]hex-3-ylmethyl)cyclopropyl)methanol	Erospicata oil, <i>Mentha spicata</i> 'Erospicata'	Curly mint oil, <i>Mentha spicata</i> var. <i>crispa</i>
CATEGORY	4773	4774	4775	4776	4777	4778
BAKED GOODS					140/300	140/300
BEVERAGES, NONALCOHOLIC	0.2/2.5	8/30	0.1/1	0.1/1	39/99	39/99
BEVERAGES, ALCOHOLIC		10/30			150/240	150/240
BREAKFAST CEREALS		12/30				
CHEESES	2/9		0.1/1	0.1/1		
CHEWING GUM		30/300	1/10	1/10	8,300/8,300	8,300/8,300
CONDIMENTS AND RELISHES	2/15	8/30				
CONFECTIONS AND FROSTINGS		30/300	0.1/5	0.1/5	650/650	650/650
EGG PRODUCTS	4/15					
FATS AND OILS	2/12	8/30				
FISH PRODUCTS	2/12					
FROZEN DAIRY					95/110	95/110
FRUIT ICES		10/30				
GELATINS AND PUDDINGS		8/30			50/200	50/200
GRANULATED SUGAR						
GRAVIES	2/15	8/30				
HARD CANDY		10/30	0.1/5	1/10	320/1,200	320/1,200
IMITATION DAIRY		8/30				
INSTANT COFFEE AND TEA	0.2/2.5	8/30	0.1/1	0.1/1		
JAMS AND JELLIES		10/30	0.1/1	0.1/1		
MEAT PRODUCTS	2/12				6/8	6/8
MILK PRODUCTS		8/30	0.1/1	0.1/1		
NUT PRODUCTS						
OTHER GRAINS						
POULTRY	2/12					
PROCESSED FRUITS						
PROCESSED VEGETABLES	2/12					
RECONSTITUTED VEGETABLES						
SEASONINGS AND FLAVORS	10/30		10/100	1/10		
SNACK FOODS	5/30	12/30				
SOFT CANDY		10/30	0.1/5	0.1/1	320/1,200	320/1,200
SOUPS	2/15	8/30				
SUGAR SUBSTITUTES						
SWEET SAUCES		15/30				

TABLE 3 Updated Anticipated Average Usual Use Levels/Anticipated Average Maximum Use Levels

Updated Anticipated Average Usual Use Levels (ppm)/Anticipated Average Maximum Use Levels (ppm) for flavoring substances previously recognized as FEMA GRAS™. Superscript 'a' represents a new use level.

	Carvone	Spearmint oil, <i>Mentha spicata</i> L.	1- <i>p</i> -Menthene-8-thiol	L-Monomenthyl glutarate	<i>Heliotropis longipes</i> extract	Scotch spearmint oil, <i>Mentha cardiaca</i> L.	<i>N</i> -[2-(3,4-Dimethoxyphenyl)ethyl]-3,4-dimethoxycinnamic acid amide	5,7-Dihydroxy-2-(3-hydroxy-4-methoxyphenyl)chroman-4-one
FEMA NO.	2249	3032	3700	4006	4220	4221	4310	4313
GRAS PUBLICATION	3	3	13	20	22	22	23	23
CATEGORY								
BAKED GOODS	94/116	1,055/1,320					10/50	
BEVERAGES, NONALCOHOLIC	34/850	110/140	0.0003/0.001	50/125	30 ^a /100		3/20	10/50
BEVERAGES, ALCOHOLIC	126/145	120/155	0.00015 ^a /0.00015 ^a	50/150	25/150		5/25	10/100
BREAKFAST CEREALS					15 ^a /15 ^a			30/60
CHEESES	0.2/0.2				15 ^a /30 ^a		10 ^a /50 ^a	20/150
CHEWING GUM	10,000/20,000	8,000 ^a /24,000 ^a	0.0003/0.004	1,500/8,000 ^a	350/800	8,000 ^a /24,000 ^a	50/100	
CONDIMENTS AND RELISHES	50/60	50/250			25/120	50/250		10 ^a /100 ^a
CONFECTIONS AND FROSTINGS			0.0003/0.002	200/600	35/70		10/20	50/100
EGG PRODUCTS							10 ^a /50 ^a	
FATS AND OILS					15 ^a /50 ^a		10 ^a /50 ^a	
FISH PRODUCTS					10 ^a /50 ^a		10 ^a /50 ^a	
FROZEN DAIRY	150/197	50/130			12 ^a /50 ^a	50/130		20/150
FRUIT ICES			0.0003/0.001	40 ^a /100 ^a	12 ^a /50 ^a		5/10	20 ^a /100 ^a
GELATINS AND PUDDINGS	87/90	90/95	0.0003/0.001		12 ^a /50 ^a			10/100
GRANULATED SUGAR								100/250
GRAVIES					25/150		10 ^a /50 ^a	10/100
HARD CANDY	5,000 ^a /10,000 ^a	5,000 ^a /10,000 ^a	0.0003/0.002	300/2,000 ^a	200/600	5,000 ^a /10,000 ^a	10/30	50/100
IMITATION DAIRY					17 ^a /50 ^a			
INSTANT COFFEE AND TEA							5/10	10/50
JAMS AND JELLIES		72/1,900	0.0003/0.001		12 ^a /50 ^a	100/200		20/50
MEAT PRODUCTS	0.1/0.1				20 ^a /50 ^a		10 ^a /75 ^a	
MILK PRODUCTS					17 ^a /50 ^a		3/10	20/150
NUT PRODUCTS								20 ^a /50 ^a
OTHER GRAINS					8 ^a /20 ^a			30 ^a /60 ^a
POULTRY					20 ^a /50 ^a		10 ^a /75 ^a	
PROCESSED FRUITS			0.0003/0.001		3 ^a /10 ^a			20 ^a /50 ^a
PROCESSED VEGETABLES					8 ^a /20 ^a		10 ^a /75 ^a	20 ^a /50 ^a
RECONSTITUTED VEGETABLES					8 ^a /20 ^a			20 ^a /50 ^a
SEASONINGS AND FLAVORS		66,670/66,670			100/500	1,000/5,000	10 ^a /75 ^a	10/100
SNACK FOODS				40/80	25/150		10 ^a /75 ^a	60/120
SOFT CANDY	5,000 ^a /10,000 ^a	5,000 ^a /10,000 ^a	0.0003/0.002	250/800 ^a	200/600	5,000 ^a /10,000 ^a	5/20	50 ^a /100 ^a
SOUPS					8 ^a /20 ^a		10 ^a /75 ^a	10/100
SUGAR SUBSTITUTES					20 ^a /50 ^a			100/250
SWEET SAUCES		40/90				40/90		10/100

	3-(4-Hydroxyphenyl)-1-(2,4,6-trihydroxyphenyl)propan-1-one	Naringin dihydrochalcone	Choline chloride	Cyclopropanecarboxylic acid (2-isopropyl-5-methylcyclohexyl)amide	Rebaudioside A	4-Amino-5,6-dimethylthieno[2,3-d]pyrimidin-2(1H)one and 4-amino-5,6-dimethylthieno[2,3-d]pyrimidin-2(1H)one hydrochloride	Arachidonic acid enriched oil	Glutamyl-valyl-glycine
FEMA NO.	4390	4495	4500	4558	4601	4669	4679	4709
GRAS PUBLICATION	23	24	24	24	24	25	25	25
CATEGORY								
BAKED GOODS		5 ^a /20 ^a	4,000 ^a /6,000 ^a		20 ^a /30 ^a	5/10	1/10	15 ^a /30 ^a
BEVERAGES, NONALCOHOLIC	15/50	50/60		0.2 ^a /1.7 ^a	20/30	7.5/15	1 ^a /2 ^a	20 ^a /50 ^a
BEVERAGES, ALCOHOLIC	15/50	50/60			20/30	7.5/15	1 ^a /2 ^a	
BREAKFAST CEREALS	20/50	150/200	4,000 ^a /6,000 ^a		20/30	10/20	1 ^a /2 ^a	80 ^a /160 ^a
CHEESES	10/50			2/6			5/50	20 ^a /50 ^a
CHEWING GUM		200/200		10 ^a /50 ^a	200/200	10/50		
CONDIMENTS AND RELISHES	10 ^a /100 ^a	5 ^a /20 ^a		4/10	20 ^a /30 ^a		1/10	30 ^a /60 ^a
CONFECTIONS AND FROSTINGS	20/100	5 ^a /20 ^a		1 ^a /20 ^a	20 ^a /30 ^a	10/25		
EGG PRODUCTS				4/10				15 ^a /45 ^a
FATS AND OILS				2/8				30 ^a /60 ^a
FISH PRODUCTS			600/1,200	2/8			1 ^a /2 ^a	15 ^a /45 ^a
FROZEN DAIRY	10/50	50/60			20/30	7.5/15	1 ^a /2 ^a	20/50
FRUIT ICES	20/50	50/60			20/30	7.5/15		20 ^a /50 ^a
GELATINS AND PUDDINGS	10/100	50/60			20/30	5/10	1 ^a /2 ^a	
GRANULATED SUGAR	20/100							
GRAVIES	10/100	5 ^a /20 ^a	4,000 ^a /6,000 ^a	4/10	20 ^a /30 ^a		10/50	30 ^a /60 ^a
HARD CANDY	20/100	50/60			20/30	10/25		
IMITATION DAIRY		50/60			20/30	7.5/15	1/10	20 ^a /50 ^a
INSTANT COFFEE AND TEA	15/50				20/30	7.5 ^a /15 ^a		10 ^a /30 ^a
JAMS AND JELLIES	20/50	50/60			20 ^a /30 ^a	10/25		
MEAT PRODUCTS		50 ^a /350 ^a	4,000 ^a /6,000 ^a	2/8	20 ^a /75 ^a		10/50	15 ^a /45 ^a
MILK PRODUCTS	10/50	50/60			20/30	7.5/15	1/10	15/45
NUT PRODUCTS	20/50							
OTHER GRAINS	20 ^a /50 ^a							
POULTRY		50 ^a /350 ^a	4,000 ^a /6,000 ^a	2/8	20 ^a /75 ^a		10/100	15 ^a /45 ^a
PROCESSED FRUITS	20 ^a /50 ^a	50/60			20/30			
PROCESSED VEGETABLES	20 ^a /50 ^a	50/60		2/8	20/30			15 ^a /45 ^a
RESTITUTED VEGETABLES	20 ^a /50 ^a							15 ^a /45 ^a
SEASONINGS AND FLAVORS	10/100	20 ^a /30 ^a	4,000 ^a /6,000 ^a	10/20	20 ^a /30 ^a	5/15	10/50	80 ^a /160 ^a
SNACK FOODS		20 ^a /30 ^a	4,000 ^a /6,000 ^a	8/20	20 ^a /30 ^a	5/15	10/50	80 ^a /160 ^a
SOFT CANDY	20/100	50/60			20/30	10/25		
SOUPS	10/100	20 ^a /30 ^a	2,500 ^a /4,000 ^a	4/10	20 ^a /30 ^a		10/50	20/50
SUGAR SUBSTITUTES	20/100					300/600		80 ^a /160 ^a
SWEET SAUCES	10/100	50/60			20/30	10/25	1 ^a /2 ^a	30 ^a /60 ^a

TABLE 3 CONTINUED- Updated Anticipated Average Usual Use Levels/Anticipated Average Maximum Use Levels

Updated Anticipated Average Usual Use Levels (ppm)/Anticipated Average Maximum Use Levels (ppm) for flavoring substances previously recognized as FEMA GRASSM. Superscript 'a' represents a new use level.

	Luo Han Fruit concentrate	Rebaudioside C
FEMA NO.	4711	4720
GRAS PUBLICATION	25	25
CATEGORY		
BAKED GOODS	40/60	100 ^a /400 ^a
BEVERAGES, NONALCOHOLIC	40/60	100/400 ^a
BEVERAGES, ALCOHOLIC	40/60	50 ^a /150 ^a
BREAKFAST CEREALS	40/80	200/400
CHEESES		
CHEWING GUM		1,000/1,000
CONDIMENTS AND RELISHES	5/40	
CONFECTIONS AND FROSTINGS	40/80	100 ^a /300 ^a
EGG PRODUCTS		
FATS AND OILS		
FISH PRODUCTS		
FROZEN DAIRY	5/80	100 ^a /300 ^a
FRUIT ICES	5/40	100 ^a /300 ^a
GELATINS AND PUDDINGS	40/80	50 ^a /300 ^a
GRANULATED SUGAR		
GRAVIES	5 ^a /40 ^a	50 ^a /100 ^a
HARD CANDY	40/80	
IMITATION DAIRY	5/40	80 ^a /200 ^a
INSTANT COFFEE AND TEA		
JAMS AND JELLIES	10/40	50/300
MEAT PRODUCTS		
MILK PRODUCTS	40/80	100 ^a /400 ^a
NUT PRODUCTS	5/40	
OTHER GRAINS		
POULTRY		
PROCESSED FRUITS	5/40	
PROCESSED VEGETABLES		
RECONSTITUTED VEGETABLES		
SEASONINGS AND FLAVORS	5/40	50 ^a /100 ^a
SNACK FOODS	5/40	
SOFT CANDY	40/80	
SOUPS		
SUGAR SUBSTITUTES		
SWEET SAUCES	5/40	



Photo courtesy of Bell Flavors and Fragrances Inc.

TABLE 4 Errata Corrections to Updated Anticipated Average Usual Use Levels/Anticipated Average Maximum Use Levels

Updated Anticipated Average Usual Use Levels (ppm)/Anticipated Average Maximum Use Levels (ppm) for the flavoring substances previously recognized as FEMA GRAS™ mentioned in Corrections and Errata inset. Superscript 'a' represents a new use level.

	<i>N</i> -Ethyl-2-isopropyl-5-methylcyclohexanecarboxamide	<i>N</i> -[(Ethoxycarbonyl)methyl]- <i>p</i> -menthane-3-carboxamide
FEMA NO.	3455	4309
GRAS PUBLICATION	9	23
CATEGORY		
BAKED GOODS		20/200
BEVERAGES, NONALCOHOLIC	10/10	10/50
BEVERAGES, ALCOHOLIC	10/10	10/400
BREAKFAST CEREALS		10/50
CHEESES		20/100
CHEWING GUM	1,400 ^a /2,000 ^a	1,000 ^a /5,000 ^a
CONDIMENTS AND RELISHES		20/300
CONFECTIONS AND FROSTINGS	10/10	10/200
EGG PRODUCTS		10/150
FATS AND OILS		10/200
FISH PRODUCTS		10/100
FROZEN DAIRY	10/10	10/300
FRUIT ICES	10/10	10/150
GELATINS AND PUDDINGS		5/100
GRANULATED SUGAR		15/100
GRAVIES		10/100
HARD CANDY	100/150 ^a	50/350
IMITATION DAIRY		10/100
INSTANT COFFEE AND TEA		10/65
JAMS AND JELLIES	10/10	10/65
MEAT PRODUCTS		10/100
MILK PRODUCTS		10/100
NUT PRODUCTS		10/200
OTHER GRAINS		10/300
POULTRY		10/100
PROCESSED FRUITS		10/200
PROCESSED VEGETABLES		10/200
RECONSTITUTED VEGETABLES		10/100
SEASONINGS AND FLAVORS		20/200
SNACK FOODS		20/300
SOFT CANDY	66 ^a /100 ^a	10/500 ^a
SOUPS		10/100
SUGAR SUBSTITUTES		5/100
SWEET SAUCES		10/100



Photo courtesy of Bell Flavors and Fragrances Inc.

TABLE 5 Errata Corrections to Updated Anticipated Average Usual Use Levels/Anticipated Average Maximum Use Levels in Chewing Gum

Updated Anticipated Average Usual Use Levels (ppm)/Anticipated Average Maximum Use Levels (ppm) in chewing gum for the flavoring substances previously recognized as FEMA GRAS™ mentioned in Corrections and Errata inset.

FEMA NO.	PRIMARY NAME	ANTICIPATED USUAL USE LEVEL (PPM)	ANTICIPATED MAXIMUM USE LEVEL (PPM)
2152	Benzyl isovalerate	70	1,000
2187	Isobutyl butyrate	50	70
2188	Butyl isobutyrate	150	1,060
2216	Butyl 10-undecenoate	400	5,000
2222	Isobutyric acid	25	110
2305	Citral dimethyl acetal	500	4,040
2316	Citronellyl propionate	5	10
2490	Furfuryl acetate	5	10
2513	Geranyl isobutyrate	20	25
2622	Lavender oil (<i>Lavandula officinalis</i> Chaix)	1	1
2630	Licorice root (<i>Glycyrrhiza glabra</i> L.)	5	10
2970	Pyruvic acid	5	10
3092	Undecanal	1	5
3170	3-Hexenoic acid	300	2,700
3181	<i>o</i> -Methoxycinnamaldehyde	360	460
3199	5-Methyl-2-phenyl-2-hexenal	1	2
3204	4-Methyl-5-thiazolethanol	35	1,000
3784	3- <i>l</i> -Menthoxyp propane-1,2-diol	1	100
3821	<i>delta</i> -3-Carene	100	215

Photo courtesy of FONA International Inc.

