GRAS Flavoring Substances 29

29. GRAS Flavoring Substances. This list of substances will appear in the 29th publication authored by the Expert Panel of the Flavor and Extract Manufacturers Association on recent progress in the consideration of flavoring ingredients "generally recognized as safe" (GRAS) under conditions of their intended use in food flavorings in accordance with the 1958 Food Additives Amendment to the Federal Food, Drug and Cosmetic Act. For more information on FEMA GRAS™ see "About the FEMA GRAS Program" on the FEMA website.

FEMA EXPERT PANEL

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The Expert Panel of the Flavor and Extract Manufacturers Association of the United States (FEMA) has evaluated substances for GRAS status under their conditions of intended use as flavoring substances since the early 1960s. The regulations of the U.S. Food and Drug Administration (FDA), and U.S. law, require that determinations that flavor substances and other food ingredients are "generally recognized as safe" (GRAS) be done in such a way that all information related to GRAS determinations is publicly available. The FEMA Expert Panel has met this requirement by publishing the identity of all flavoring substances determined to be GRAS by the Panel, and has submitted all information related to its GRAS reviews on these substances to the FDA for inclusion in the FDA databases. Information that was reviewed by the Expert Panel in the course of their evaluation of new flavoring substances is typically submitted to FDA within six months of the publication of their identity. The Expert Panel also publishes separate extensive reviews of scientific information on all FEMA GRAS flavoring substances in the peer-reviewed scientific literature in the form of reports on the safety of structurally -related groups of flavoring substances. These important actions assure that there is "general recognition" of the safety of these substances when used as flavors.

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Ethyl Nitrite DeGRAS

The FEMA GRAS status of ethyl nitrate (FEMA 2446) under the conditions of intended use as a flavor ingredient was reviewed. The Expert Panel concluded that additional data including testing for vascular effects and GLP-compliant in vitro and in vivo genotoxicity testing are required for the continuation of its GRAS status. Until such studies become available the flavor ingredient ethyl nitrite has been removed from the GRAS list.

Table 1. Primary names (in boldface) Synonyms (in lightface)

FEMA No.	Primary Names and Synonyms
4880	2-(4-Ethylphenoxy)- <i>N-</i> (1 <i>H-</i> pyrazol-3-yl)- <i>N-</i> (thiophen-2-ylmethyl)acetamide 2-(4-Ethylphenoxy)- <i>N-</i> (1 <i>H-</i> pyrazol-5-yl)- <i>N-</i> (thiophen-2-ylmethyl)acetamide
4881	N-(3-Hydroxy-4-methoxyphenyl)-2-isopropyl-5,5-dimethylcyclohexanecarboxamide
4882	N-(4-(Cyanomethyl)phenyl)-2-isopropyl-5,5-dimethylcyclohexanecarboxamide
4884	6-Methyl-5-hepten-2-ol (+/-)-6-Methyl-5-hepten-2-ol Sulcatol (+/-)-Sulcatol 2-Methyl-2-hepten-6-ol 6-Hydroxy-2-methyl-2-heptene 6-Methylhept-5-en-2-ol
4890	3-p-Menthen-7-al
4891	(E)-3-Methyl-4-dodecenoic acid
4892	cis-2-Hexylcyclopropaneacetic acid
4895	Rebaudioside M
4896	N-(2-Hydroxy-2-phenylethyl)-2-isopropyl-5,5-dimethylcyclohexane-1-carboxamide
4897	Allulose D-Psicose
4898	trans-5-Octenal
4899	<i>N</i> -(1-((4-amino-2,2-dioxido-1 <i>H</i> -benzo[<i>c</i>][1,2,6]thiadiazin-5-yl)oxy)-2-methylpropan-2-yl)-2,6-dimethylisonicotinamide
4903	Ethyl 3-methyl-2-oxopentanoate
4909	Glucosylated steviol glycosides, 70-80%
4914	bis-(3-Methyl-2-butenyl)disulfide
	bis (3-methyl-2-buten-1-yl) disulfide
4915	(5Z)-3,4-Dimethyl-5-propylidene-2(5H)-furanone
4916	2-Methyl-3-butene-2-thiol
	α,α-Dimethyl allyl mercaptan
4917	(Z)-9-Dodecenoic acid
	(9Z)-9-Dodecenoic acid
	9-Dodecenoic acid, (Z)-
	cis-9-Dodecenoic acid
	Lauroleic acid
4920	1-Ethyl-2-(1-pyrrolylmethyl)pyrrole
4921	Rebaudioside D, 95%
4922	Rebaudioside M, 95%
4926	(Z)-8-Pentadecenal
4928	2-Methylthiophene
4929	4-Methylidene-2-(2-methylprop-1-enyl)oxane
4930	4-Isopropoxycinnamaldehyde
4931	Glucosylated steviol glycosides, 90%

Table 2. Average Usual Use Levels (ppm)/Average Maximum Use Levels (ppm) on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS)

	2-(4-Ethylphenoxy)-N-(1 <i>H</i> -pyrazol-3-yl)-N-(thiophen-2-ylmethyl)acetamide	N-(3-Hydroxy-4-methoxyphenyl)- 2-isopropyl-5,5- dimethylcyclohexanecarboxamide	N-(4-(Cyanomethyl)phenyl)-2- isopropyl-5,5- dimethylcyclohexanecarboxamide	6-Methyl-5-hepten-2-ol	3-p-Menthen-7-al
Category/FEMA No.	4880	4881	4882	4884	4890
Baked Goods	3/15	0/0	0/0	10/50	0.001/0.01
Beverages, Non-Alcoholic	1/3	0.1/10	0.1/10	5/25	0.0003/0.005
Beverages, Alcoholic	2/6	0.1/10	0.1/10	10/50	0.0003/0.005
Breakfast Cereals	3/15	0/0	0/0	5/25	0/0
Cheeses	0/0	0/0	0/0	7/35	0.001/0.01
Chewing Gum	75/150	1/100	1/100	0/0	0.001/0.01
Condiments and Relishes	3/15	0.1/10	0.1/10	5/25	0.01/0.1
Confections and Frostings	5/30	1/100	1/100	10/50	0.001/0.01
Egg Products	3/15	0/0	0/0	0/0	0/0
Fats and Oils	3/15	0.05/5	0.05/5	5/25	0.01/0.1
Fish Products	0/0	0/0	0/0	2/10	0/0
Frozen Dairy	1/3	0.1/10	0.1/10	0/0	0.001/0.01
Fruit Ices	1/3	0.1/10	0.1/10	10/50	0.0005/0.01
Gelatins and Puddings	1/3	0.05/5	0.05/5	0/0	0.0005/0.01
Granulated Sugar	0/0	0/0	0/0	0/0	0/0
Gravies	3/15	0.05/5	0.05/5	5/25	0/0
Hard Candy	5/15	0.1/10	0.1/10	0/0	0.001/0.01
Imitation Dairy	1/3	0.05/5	0.05/5	7/35	0/0
Instant Coffee and Tea	1/3	0.01/1	0.01/1	5/25	0/0
Jams and Jellies	1/3	0.1/10	0.1/10	20/100	0.0005/0.01
Meat Products	3/15	0/0	0/0	2/10	0.001/0.01
Milk Products	1/3	0.05/5	0.05/5	7/35	0/0
Nut Products	1/3	0/0	0/0	0/0	0/0
Other Grains	0/0	0/0	0/0	5/25	0/0
Poultry	3/15	0/0	0/0	2/10	0/0
Processed Fruits	1/3	0/0	0/0	7/35	0/0
Processed Vegetables	3/15	0/0	0/0	0/0	0/0
Reconstituted Vegetables	3/15	0/0	0/0	0/0	0/0
Seasonings and Flavors	3/15	3/900	3/900	5/25	0.05/0.3
Snack Foods	3/15	0.1/10	0.1/10	10/50	0.003/0.1
Soft Candy	5/15	0.1/10	0.1/10	0/0	0.001/0.01
Soups	3/15	0.1/10	0.1/10	5/25	0.0005/0.01
Sugar Substitutes	0/0	0.005/0.5	0.005/0.5	0/0	0/0
Sweet Sauces	5/15	0.5/50	0.5/50	5/25	0.001/0.01
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Table 2. Average Usual Use Levels (ppm)/Average Maximum Use Levels (ppm) on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS)

	(E)-3-Methyl-4-dodecenoic acid	<i>cis-</i> 2-Hexylcyclopropaneacetic acid	Rebaudioside M	N-(2-Hydroxy-2-phenylethyl)-2- isopropyl-5,5- dimethylcyclohexane-1- carboxamide
Category/FEMA No.	4891	4892	4895	4896
Baked Goods	0.1/1	0.001/0.01	0/0	0/0
Beverages, Non-Alcoholic	0.001/0.1	0.0002/0.005	15/20	1/100
Beverages, Alcoholic	0.001/0.1	0.0002/0.005	0/0	1/100
Breakfast Cereals	0/0	0/0	0/0	0/0
Cheeses	0/0	0/0	0/0	0/0
Chewing Gum	0.001/0.1	0.001/0.01	0/0	10/1000
Condiments and Relishes	0/0	0.001/0.01	0/0	1/100
Confections and Frostings	0.001/0.3	0.0005/0.005	0/0	10/1000
Egg Products	0.001/0.3	0.0005/0.005	0/0	0/0
Fats and Oils	0.01/0.1	0.01/0.1	0/0	0.5/50
Fish Products	0.001/0.3	0.001/0.01	0/0	0/0
Frozen Dairy	0.001/0.2	0.001/0.01	15/20	1/100
Fruit Ices	0.001/0.2	0.0005/0.005	15/20	1/100
Gelatins and Puddings	0.01/0.1	0.0005/0.005	0/0	0.5/50
Granulated Sugar	0/0	0/0	0/0	0/0
Gravies	0.001/0.05	0/0	0/0	0.5/50
Hard Candy	0.001/0.3	0.001/0.01	0/0	1/100
Imitation Dairy	0.0001/0.05	0.001/0.01	15/20	0.5/50
Instant Coffee and Tea	0.0001/0.1	0.0002/0.005	15/20	0.1/10
Jams and Jellies	0/0	0.0005/0.005	0/0	1/100
Meat Products	0/0	0/0	0/0	0/0
Milk Products	0.001/0.05	0.001/0.01	15/20	0.5/50
Nut Products	0.001/0.05	0.001.0.01	0/0	0/0
Other Grains	0/0	0/0	0/0	0/0
Poultry	0/0	0/0	0/0	0/0
Processed Fruits	0/0	0/0	15/20	0/0
Processed Vegetables	0/0	0/0	0/0	0/0
Reconstituted Vegetables	0/0	0/0	0/0	0/0
Seasonings and Flavors	0.01/2	0.01/0.2	0/0	30/9000
Snack Foods	0.001/0.3	0.001/0.01	0/0	1/100
Soft Candy	0.001/0.3	0.001/0.01	0/0	1/100
Soups	0.0001/0.3	0.0002/0.005	0/0	1/100
Sugar Substitutes	0.001/0.05	0/0	0/0	0.05/5
Sweet Sauces	0/0	0.001/0.01	0/0	5/500
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Table 2. Average Usual Use Levels (ppm)/Average Maximum Use Levels (ppm) on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS)

	Allulose	trans-5-Octenal	N-(1-((4-amino-2,2-dioxido-1 <i>H</i> -benzo[c][1,2,6]thiadiazin-5-yl)oxy)-2-methylpropan-2-yl)-2,6-dimethylisonicotinamide	Ethyl 3-methyl-2-oxopentanoate	Glucosylated steviol glycosides, 70-80%
Category/FEMA No.	4897	4898	4899	4903	4909
Baked Goods	0/0	5/50	0/0	10/100	0/0
Beverages, Non-Alcoholic	15000/20000	2.5/25	15/15	5/50	55/65
Beverages, Alcoholic	0/0	2.5/25	0/0	2.5/25	0/0
Breakfast Cereals	0/0	10/100	0/0	5/50	0/0
Cheeses	0/0	0/0	0/0	0/0	0/0
Chewing Gum	0/0	50/250	0/0	10/100	0/0
Condiments and Relishes	0/0	0/0	0/0	0/0	0/0
Confections and Frostings	0/0	5/50	0/0	5/50	0/0
Egg Products	0/0	0/0	0/0	0/0	0/0
Fats and Oils	0/0	3/30	0/0	5/50	0/0
Fish Products	0/0	3/30	0/0	0/0	0/0
Frozen Dairy	0/0	5/50	0/0	5/50	55/65
Fruit Ices	0/0	5/50	0/0	5/50	0/0
Gelatins and Puddings	0/0	10/100	0/0	5/50	0/0
Granulated Sugar	0/0	0/0	0/0	0/0	0/0
Gravies	0/0	0.5/5	0/0	0/0	0/0
Hard Candy	0/0	10/50	0/0	10/100	0/0
Imitation Dairy	0/0	3/30	6/15	2.5/25	55/65
Instant Coffee and Tea	0/0	5/50	6/15	5/50	55/65
Jams and Jellies	0/0	5/50	0/0	2.5/25	0/0
Meat Products	0/0	0/0	0/0	0/0	0/0
Milk Products	0/0	3/30	6/15	2.5/25	55/65
Nut Products	0/0	3/30	0/0	5/50	0/0
Other Grains	0/0	0/0	0/0	5/50	0/0
Poultry	0/0	0/0	0/0	0/0	0/0
Processed Fruits	0/0	0/0	0/0	0/0	0/0
Processed Vegetables	0/0	0/0	0/0	0/0	0/0
Reconstituted Vegetables	0/0	0/0	0/0	0/0	0/0
Seasonings and Flavors	0/0	0/0	0/0	10/100	0/0
Snack Foods	0/0	15/150	0/0	2.5/25	0/0
Soft Candy	0/0	10/100	0/0	5/50	0/0
Soups	0/0	0.5/5	0/0	2.5/25	0/0
Sugar Substitutes	0/0	0/0	0/0	0/0	0/0
Sweet Sauces	0/0	10/100	0/0	2.5/25	0/0

Table 2. Average Usual Use Levels (ppm)/Average Maximum Use Levels (ppm) on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS)

	bis-(3-Methyl-2-butenyl)disulfide	(5Z)-3,4-Dimethyl-5-propylidene- 2(5H)-furanone	2-Methyl-3-butene-2-thiol	(Z)-9-Dodecenoic acid	1-Ethyl-2-(1- pyrrolylmethyl)pyrrole
Category/FEMA No.	4914	4915	4916	4917	4920
Baked Goods	0.1/1	0/0	0.001/0.05	1/10	0.00001/0.002
Beverages, Non-Alcoholic	0.005/0.05	0.01/0.1	0.0001/0.002	0.02/0.2	0.00001/0.002
Beverages, Alcoholic	0.005/0.05	0.01/0.1	0.0001/0.002	0.02/0.2	0.00001/0.002
Breakfast Cereals	0.1/1	0/0	0/0	0.05/5	0/0
Cheeses	0.1/1	0/0	0.0005/0.005	0.2/2	0/0
Chewing Gum	0.1/1	0/0	0.001/0.02	0.1/1	0/0
Condiments and Relishes	0.1/1	0.1/1	0.001/0.01	0.1/1	0.00001/0.002
Confections and Frostings	0.1/1	0/0	0.0005/0.005	0.1/1	0/0
Egg Products	0.1/1	0/0	0.0002/0.002	0.05/0.5	0/0
Fats and Oils	0.1/1	0/0	0/0	0.5/5	0.00001/0.002
Fish Products	0.1/1	0/0	0/0	0.05/0.5	0/0
Frozen Dairy	0.1/1	0/0	0.0002/0.003	0.05/0.5	0/0
Fruit Ices	0.1/1	0.001/0.01	0.0002/0.003	0.05/0.5	0/0
Gelatins and Puddings	0.1/1	0.001/0.01	0.0002/0.003	0.05/0.5	0/0
Granulated Sugar	0.1/1	0/0	0/0	0/0	0/0
Gravies	0.1/1	0/0	0.001/0.01	0.05/0.5	0/0
Hard Candy	0.1/1	0.1/5	0.001/0.01	0.05/0.5	0/0
Imitation Dairy	0.1/1	0/0	0/0	0.5/5	0/0
Instant Coffee and Tea	0.1/1	0.01/0.1	0.0003/0.005	0.02/0.2	0.00001/0.002
Jams and Jellies	0.1/1	0/0	0/0	0.05/0.5	0/0
Meat Products	0.1/1	0/0	0.001/0.01	0.05/0.5	0/0
Milk Products	0.1/1	0.01/0.1	0.0001/0.002	0.5/5	0/0
Nut Products	0.1/1	0/0	0/0	0.05/0.5	0.00001/0.002
Other Grains	0.1/1	0/0	0/0	0.05/0.5	0/0
Poultry	0.1/1	0/0	0/0	0.05/0.5	0/0
Processed Fruits	0.1/1	0/0	0/0	0/0	0/0
Processed Vegetables	0.1/1	0/0	0/0	0/0	0/0
Reconstituted Vegetables	0.1/1	0/0	0/0	0/0	0/0
Seasonings and Flavors	0.1/1	0.01/0.1	0.1/1	0.05/0.5	0/0
Snack Foods	0.1/1	0.01/0.1	0.005/0.1	0.05/0.5	0/0
Soft Candy	0.1/1	0/0	0.001/0.01	0.10/1	0/0
Soups	0.1/1	0/0	0.003/0.005	0.02/0.2	0.00001/0.002
Sugar Substitutes	0.1/1	0/0	0/0	0/0	0/0
Sweet Sauces	0.1/1	0.1/5	0.001/0.01	0.05/2	0/0
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Table 2. Average Usual Use Levels (ppm)/Average Maximum Use Levels (ppm) on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS)

Category/FEMA No. 4921 4922 4926 4928 4929 4930 Baked Goods 15/32.5 10/24 0.001/0.1 0.3/10 0/0 0/0 0/0 0.0000/2/0.002 0.1/5 0.01/0.5 0.5/25 Beverages, Non-Alcoholic 15/32.5 10/24 0.00002/0.002 0.1/5 0.01/0.5 0.5/25 Beverages, Alcoholic 15/32.5 10/24 0.0001/0.005 0.3/10 0.1/5 0.07 0.0 Cheses 0/0 0/0 0.00002/0.002 0.1/5 0.0 0/0 0/0 0.0001/0.01 0.1/5 0.0 0/0 Chewing Gum 200/325 10/24 0.0001/0.01 0.1/5 0.03/1.5 2/25 Conflections and Frostings 15/32.5 10/24 0.0001/0.01 0.1/5 0/0 0/0 Conflections and Frostings 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Egg Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0		Rebaudioside D, 95%	Rebaudioside M, 95%	(Z)-8-Pentadecenal	2-Methylthiophene	4-Methylidene-2-(2-methylprop-1- enyl)oxane	4-Isopropoxycinnamaldehyde
Beverages, Non-Alcoholic	· ·						
Beverages, Alcoholic							
Breakfast Cereals							
Cheeses 0/0 0/0 0.0002/0.02 0.1/5 0/0 0/0 Chewing Gum 200/325 10/240 0.0001/0.01 0.1/5 0.03/1.5 2/25 Condiments and Relishes 15/32.5 10/24 0.0001/0.01 0.1/5 0/0 0/0 Confections and Frostings 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Egg Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fats and Oils 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fish Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Gravies 0/0 0/0 0/0							
Chewing Gum 200/325 10/240 0.0001/0.01 0.1/5 0.03/1.5 2/25 Condiments and Relishes 15/32.5 10/24 0.0001/0.01 0.1/5 0/0 0/0 Confections and Frostings 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Egg Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fats and Oils 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fish Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Fruit Ices 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Gravies 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0	Breakfast Cereals		10/24	0.0001/0.005	0.3/10		0/0
Condiments and Relishes 15/32.5 10/24 0.0001/0.01 0.1/5 0/0 0/0 Confections and Frostings 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Egg Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fats and Oils 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fish Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Froit Ices 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Granulated Sugar 0/0<							
Confections and Frostings 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Egg Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fats and Oils 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Fish Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Fruit Ices 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Granulated Sugar 0/0							
Egg Products	Condiments and Relishes						0/0
Fats and Oils 0/0 0/0 0.001/0.1 0.1/5 0/0 0/0 Fish Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Fruit Ices 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Gravies 0/0 </th <th>Confections and Frostings</th> <th>15/32.5</th> <th>10/24</th> <th>0.0001/0.01</th> <th>0.3/10</th> <th>0.03/1.5</th> <th>0/0</th>	Confections and Frostings	15/32.5	10/24	0.0001/0.01	0.3/10	0.03/1.5	0/0
Fish Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Fruit Ices 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Granulated Sugar 0/0	Egg Products	0/0	0/0		0.1/5	0/0	0/0
Frozen Dairy 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Fruit Ices 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Granulated Sugar 0/0	Fats and Oils	0/0	0/0	0.001/0.1	0.1/5	0/0	0/0
Fruit Ices 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Granulated Sugar 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Gravies 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Hard Candy 15/32.5 10/24 0.0001/0.005 0.3/10 0.1/5 0/0 Imitation Dairy 15/32.5 10/24 0.0005/0.05 0.3/10 0/0 0/0 Instant Coffee and Tea 15/32.5 10/24 0.0005/0.05 0.3/10 0/0 0/0 Jams and Jellies 15/32.5 10/24 0.0001/0.005 0.1/5 0.01/0.5 0.1/15 0/0 Meat Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Milk Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Other Grains	Fish Products	0/0	0/0	0.0001/0.005	0.1/5	0/0	0/0
Gelatins and Puddings 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Granulated Sugar 0/0 <t< th=""><th>Frozen Dairy</th><th>15/32.5</th><th>10/24</th><th>0.0001/0.005</th><th>0.1/5</th><th>0/0</th><th>0/0</th></t<>	Frozen Dairy	15/32.5	10/24	0.0001/0.005	0.1/5	0/0	0/0
Granulated Sugar 0/0	Fruit Ices	15/32.5	10/24	0.0001/0.005	0.1/5	0.03/1.5	0/0
Gravies 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Hard Candy 15/32.5 10/24 0.0001/0.005 0.3/10 0.1/5 0/0 Imitation Dairy 15/32.5 10/24 0.0005/0.05 0.3/10 0/0 0/0 Instant Coffee and Tea 15/32.5 10/24 0.00002/0.002 0.1/5 0.01/0.5 0.1/15 Jams and Jellies 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Meat Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Milk Products 15/32.5 10/24 0.0005/0.05 0.1/5 0/0 0/0 Nut Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0	Gelatins and Puddings	15/32.5	10/24	0.0001/0.005	0.1/5	0.03/1.5	0/0
Hard Candy 15/32.5 10/24 0.0001/0.005 0.3/10 0.1/5 0/0 Imitation Dairy 15/32.5 10/24 0.0005/0.05 0.3/10 0/0 0/0 Instant Coffee and Tea 15/32.5 10/24 0.00002/0.002 0.1/5 0.01/0.5 0.1/15 Jams and Jellies 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Meat Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Milk Products 15/32.5 10/24 0.0005/0.05 0.1/5 0/0 0.0 Nut Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0.0 Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0 0/0 0/0 0/0 Reconstituted Vegetables 0/0 0/0 0/0	Granulated Sugar	0/0	0/0	0/0	0/0	0/0	0/0
Imitation Dairy	Gravies	0/0	0/0	0.0001/0.005	0.1/5	0/0	0/0
Instant Coffee and Tea 15/32.5 10/24 0.00002/0.002 0.1/5 0.01/0.5 0.1/15 Jams and Jellies 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Meat Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Milk Products 15/32.5 10/24 0.0005/0.05 0.1/5 0/0 0.2/15 Nut Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0 0/0 0/0 0/0 Processed Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Reconstituted Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Saack Foods 15/32.5 10/24	Hard Candy	15/32.5	10/24	0.0001/0.005	0.3/10	0.1/5	0/0
Jams and Jellies 15/32.5 10/24 0.0001/0.005 0.1/5 0.03/1.5 0/0 Meat Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Milk Products 15/32.5 10/24 0.0005/0.05 0.1/5 0/0 0.2/15 Nut Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0 0/0 0/0 0/0 Processed Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Reconstituted Vegetables 0/0	Imitation Dairy	15/32.5	10/24	0.0005/0.05	0.3/10	0/0	0/0
Meat Products 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Milk Products 15/32.5 10/24 0.0005/0.05 0.1/5 0/0 0.2/15 Nut Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0 <th>Instant Coffee and Tea</th> <th>15/32.5</th> <th>10/24</th> <th>0.00002/0.002</th> <th>0.1/5</th> <th>0.01/0.5</th> <th>0.1/15</th>	Instant Coffee and Tea	15/32.5	10/24	0.00002/0.002	0.1/5	0.01/0.5	0.1/15
Milk Products 15/32.5 10/24 0.0005/0.05 0.1/5 0/0 0.2/15 Nut Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0 </th <th>Jams and Jellies</th> <th>15/32.5</th> <th>10/24</th> <th>0.0001/0.005</th> <th>0.1/5</th> <th>0.03/1.5</th> <th>0/0</th>	Jams and Jellies	15/32.5	10/24	0.0001/0.005	0.1/5	0.03/1.5	0/0
Nut Products 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0 0/0 0/0 0/0 Processed Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Reconstituted Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Seasonings and Flavors 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Snack Foods 15/32.5 10/24 0.0001/0.005 0.3/10 0/0 0.2/10 Soft Candy 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Soups 15/32.5 10/24 0.0002/0.002 0.1/5 0/0 0/0 Sugar Substitutes 0/0 0/0 0/0 <th>Meat Products</th> <th>0/0</th> <th>0/0</th> <th>0.0001/0.005</th> <th>0.1/5</th> <th>0/0</th> <th>0/0</th>	Meat Products	0/0	0/0	0.0001/0.005	0.1/5	0/0	0/0
Other Grains 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0	Milk Products	15/32.5	10/24	0.0005/0.05	0.1/5	0/0	0.2/15
Poultry 0/0 0/0 0.0001/0.005 0.1/5 0/0 0/0 Processed Fruits 15/32.5 10/24 0/0 0/0 0/0 0/0 Processed Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Reconstituted Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Seasonings and Flavors 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Snack Foods 15/32.5 10/24 0.0001/0.005 0.3/10 0/0 0.2/10 Soft Candy 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Soups 15/32.5 10/24 0.00002/0.002 0.1/5 0/0 0/0 Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 0/0 0/0 1/25	Nut Products	15/32.5	10/24	0.0001/0.005	0.1/5	0/0	0/0
Processed Fruits 15/32.5 10/24 0/0 0/0 0/0 0/0 Processed Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Reconstituted Vegetables 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 Seasonings and Flavors 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Snack Foods 15/32.5 10/24 0.0001/0.005 0.3/10 0/0 0.2/10 Soft Candy 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Soups 15/32.5 10/24 0.00002/0.002 0.1/5 0/0 0/0 Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 0/0 0/0	Other Grains	15/32.5	10/24	0.0001/0.005	0.1/5	0/0	0/0
Processed Vegetables 0/0 1/25 Processed Vegetables 0/0	Poultry	0/0	0/0	0.0001/0.005	0.1/5	0/0	0/0
Reconstituted Vegetables 0/0 1/25 Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 1/25	Processed Fruits	15/32.5	10/24	0/0	0/0	0/0	0/0
Seasonings and Flavors 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0 Snack Foods 15/32.5 10/24 0.0001/0.005 0.3/10 0/0 0.2/10 Soft Candy 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Soups 15/32.5 10/24 0.00002/0.002 0.1/5 0/0 0/0 Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 0/0 1/25	Processed Vegetables	0/0	0/0	0/0	0/0	0/0	0/0
Snack Foods 15/32.5 10/24 0.0001/0.005 0.3/10 0/0 0.2/10 Soft Candy 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Soups 15/32.5 10/24 0.00002/0.002 0.1/5 0/0 0/0 Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 1/25	Reconstituted Vegetables	0/0	0/0	0/0	0/0	0/0	0/0
Soft Candy 15/32.5 10/24 0.0001/0.01 0.3/10 0.03/1.5 0/0 Soups 15/32.5 10/24 0.00002/0.002 0.1/5 0/0 0/0 Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 0/0 1/25	Seasonings and Flavors	15/32.5	10/24	0.0001/0.005	0.1/5	0/0	0/0
Soups 15/32.5 10/24 0.00002/0.002 0.1/5 0/0 0/0 Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 1/25	Snack Foods	15/32.5	10/24	0.0001/0.005	0.3/10	0/0	0.2/10
Sugar Substitutes 0/0 0/0 0/0 0/0 0/0 1/25	Soft Candy	15/32.5	10/24	0.0001/0.01	0.3/10	0.03/1.5	0/0
	Soups	15/32.5	10/24	0.00002/0.002	0.1/5	0/0	0/0
Supert Sources 45/20 5 40/24 0.0004/0.005 0.4/5 0/0 0/0	Sugar Substitutes	0/0	0/0	0/0	0/0	0/0	1/25
Sweet Sauces 15/32.5 10/24 0.0001/0.005 0.1/5 0/0 0/0	Sweet Sauces	15/32.5	10/24	0.0001/0.005	0.1/5	0/0	0/0

Table 2. Average Usual Use Levels (ppm)/Average Maximum Use Levels (ppm) on which the FEMA Expert Panel based its judgments that the substances are generally recognized as safe (GRAS)

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	Glucosylated steviol glycosides, 90%
Category/FEMA No.	4931
Baked Goods	100/100
Beverages, Non-Alcoholic	100/100
Beverages, Alcoholic	100/100
Breakfast Cereals	100/100
Cheeses	100/100
Chewing Gum	100/100
Condiments and Relishes	100/100
Confections and Frostings	100/100
Egg Products	0/0
Fats and Oils	100/100
Fish Products	0/0
Frozen Dairy	100/100
Fruit Ices	100/100
Gelatins and Puddings	100/100
Granulated Sugar	0/0
Gravies	100/100
Hard Candy	100/100
Imitation Dairy	100/100
Instant Coffee and Tea	100/100
Jams and Jellies	100/100
Meat Products	0/0
Milk Products	100/100
Nut Products	100/100
Other Grains	100/100
Poultry	0/0
Processed Fruits	100/100
Processed Vegetables	100/100
Reconstituted Vegetables	100/100
Seasonings and Flavors	100/100
Snack Foods	100/100
Soft Candy	100/100
Soups	100/100
Sugar Substitutes	0/0
Sweet Sauces	100/100

Table 3. Identity for Natural Flavor Complexes as Evaluated by the FEMA Expert Panel

FEMA No.	FEMA Primary Name	The Identification Value as Reviewed by the FEMA Expert Panel
4895	Rebaudioside M	Rebaudioside M ≥80%; Rebaudioside D 5-20%; Total steviol glycosides ≥95%.
4909	Glucosylated steviol glycosides, 70-80%	Supraglucosylated steviol glycosides 70-80%; Rebaudioside A 14-20%; Steviol glycosides not further glucosylated not to individually exceed 1% each; Maltodextrin 3-10%
4921	Rebaudioside D, 95%	Rebaudioside D ≥95%; Total other steviol glycosides <3.5%
4922	Rebaudioside M, 95%	Rebaudioside M ≥95%; Rebaudioside B <2%; Rebaudioside A <1.5%; Total other steviol glycosides <1.5%
4931	Glucosylated steviol glycosides, 90%	Not less than 90% of total steviol glycosides inclusive of supraglucosylated steviol glycosides; Rebaudioside A less than 3%; Stevioside less than 2%; other individual steviol glycosides not further glucosylated each less than 2%; Maltodextrin less than 10%