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GB

**National Standard
of the People's Republic of China**

GB 30616-2014

**National Food Safety Standard
Flavors Used for Food**

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National Food Safety Standard

Flavors Used for Food

1 Scope

This standard applies to flavors used for food.

2 Terms and definitions

The following terms and definitions apply to this document.

2.1 Flavors used for food

It refers to the concentrated blended mixtures (except the preparations that only produce salty, sweet, or sour) that are composed OF spices used for food and (or) thermal-processing flavors used for food AND flavor materials used for food, and are used to add fragrance. They contain or do-not-contain flavor materials used for food. Usually they are not directly used for consumption, but used in food processing.

Note 1: It shall be distinguished strictly between flavors used for food and condiments. Condiments are a category of food that can be eaten directly. Flavors used for food can be a small components of condiments.

Note 2: Flavors used for food shall be used appropriately according to production needs.

2.2 Flavor accessories used for food

It refers to the food additives and food ingredients that are needed in the production, storage, and application of flavors used for food. The added food additives (except flavor enhancers and acidity regulator) have no function in the final flavored products.

2.3 Thermal-processing flavors used for food

It refers to a kind of product or mixture that is prepared for flavor characteristics of food. It is the product made by food ingredients or food ingredient components after the food preparation is processed similar to cooking.

2.4 Samples

From the sampled samples, TAKE the samples for test.

2.5 Standard samples

The enterprise technical department and relevant departments / personnel conduct tests and flavor-evaluations to the samples. And DETERMINE them as the standard samples for testing.

2.6 Liquid flavors

It refers to the flavors that use oil or oil-soluble substances as solvents, and water or water-soluble substances as solvents. They are generally liquid at room temperature.

2.7 Emulsified flavors

The oil-in-water flavors that are produced by emulsified homogeneous.

2.8 Slurry (paste)-state flavors

All kinds of flavors that appear in slurry (paste) states.

2.9 Mixing-type powder flavors

The powder flavors of which the aroma and (or) the fragrance components are mixed with solid powder carriers.

2.10 Capsule-type powder flavors

The granular-type flavors of which the aroma and (or) the fragrance components are wrapped in solid wall materials in the form of core material.

3 Technical requirements

3.1 Requirements for raw materials

All kinds of spices used in flavors used for food shall comply with the specifications of GB 2760 "National food safety standard — Standards for uses of food additives". Edible alcohol shall comply with the specifications of GB 10343 "Edible alcohol". Vegetable oil shall comply with the specifications of GB 2716 "National food safety standard — Hygienic standard for edible vegetable oil". The list of flavor materials used for food that are allowed to be used is shown in Annex A.

3.2 Sensory requirements

Sensory requirements shall comply with the specifications of Table 1.

Table 1 Sensory requirements

Items	Requirements	Inspection methods
Color ^a	Standard samples that comply with the same	B.1 of Annex B

thousand-fold dilution ^d		precipitation		
Heavy metal (in Pb) content/(mg/kg) ≤			10	GB/T 5009.74
Arsenic (in As) content		≤ 3mg/kg (only SWTERMINE the inorganic arsenic content for the flavors used for food that contain the components from marine products, The inorganic arsenic content shall ≤ 1.5mg/kg)		GB/T 5009.11 or GB/T 5009.76
Methanol content ^b /‰ ≤	0.2		—	GB/T 7917.4
Note: Relative density, refraction index, moisture, granularity, stability of stock solution, and stability of thousand-fold dilution are factory-exit inspection items. Inspection items of type inspection are all items. Both of them are conducted once a year.				
^a Determination of peroxide value only applies to the products of which the animal and vegetable oils content is ≥ 20%.				
^b Determination of methanol content only applies to the products of which the edible alcohol is ≥ 20%.				
^c Granularity of emulsified flavors only applies to the emulsified flavors used for beverages.				
^d Stability of thousand-fold dilution only applies to the emulsified flavors used for beverages.				

3.4 Microbiological indicators

Microbiological indicators shall comply with the specifications of Table 3.

Table 3 Microbiological indicators

Items	Liquid flavor	Emulsified flavor	Slurry (paste) -state flavors	Power flavor		Inspection methods
				Mixing-type	Capsule-type	
Total amount of colonies/(CFU/g or CFU/mL)	—	≤ 5 000	≤ 30 000			GB 4789.2
Coliform/(MPN/g or MPN/mL)	—	≤ 3.6	≤ 15			GB 4789.3

4 Label

It shall be labelled according to GB 29924 "National food safety standard — General rule for the making of food additives". For those products containing thermal-processing flavors used for food, the relative density and refraction index are

not required to be tested. The ingredient list in their product labels shall indicate “Thermal-processing flavors used for food”. For those products containing the components from marine products, it shall indicate “This product contains the components from marine products” on the product label.

5 Others

According to process needs, coloring agents, sweeteners, and caffeine that are allowed in GB 2760 can be used in flavors used for food. But the variety and the added amount shall be consistent with the requirements of the final food.

Annex A

Accessories list that are allowed to be used in flavors used for food

A.1 Solvents and carriers are shown in Table A.1.

Table A.1 Solvents and carriers

NO.	Chinese name of solvents and carriers	English name of solvents and carriers	CNS code	INS code
1	microcrystalline cellulose	microcrystalline cellulose	02.005	450i
2	phospholipid	phospholipid	04.010	322
3	sucrose esters of fatty acid	sucrose esters of fatty acid	10.001	473
4	mono- and diglycerides of fatty acids	mono- and diglycerides of fatty acids	10.006	471
5	octyl and decyl glycerate	octyl and decyl glycerate	10.018	—
6	sodium starch octenyl succinate	sodium starch octenyl succinate	10.030	1450
7	glycerine (glycerol)	glycerine (glycerol)	15.014	422
8	propylene glycol	propylene glycol	18.004	1520
9	sorbitol and sorbitol syrup	sorbitol and sorbitol syrup	19.006	420i 420ii
10	D-mannitol	D-mannitol	19.017	421
11	agar	agar	20.001	406
12	gelatin	gelatin	20.002	—
13	sodium carboxy methyl	sodium carboxy methyl	20.003	466
14	sodium alginate potassium alginate	sodium alginate potassium alginate	20.004 20.005	401 402
15	pectins	pectins	20.006	440
16	carrageenan	carrageenan	20.007	407
17	gum arabic	gum arabic	20.008	414
18	xanthan gum	xanthan gum	20.009	415
19	propylene glycol alginate	propylene glycol alginate	20.010	405
20	hydroxypropyl starch	hydroxypropyl starch	20.014	1440
21	polydextrose	polydextrose	20.022	1200
22	carob bean gum	carob bean gum	20.023	410
23	beta-cyclodextrin	beta-cyclodextrin	20.024	459
24	guar gum	guar gum	20.025	412
25	oxidized starch	oxidized starch	20.030	1404
26	methyl cellulose	methyl cellulose	20.043	461

	phosphate sodium phosphatedibasic	phosphate sodium phosphatedibasic		
14	acetic acid	acetic acid	01.107	260
15	hydrochloric acid	hydrochloric acid	01.108	507
16	acetic acid	acetic acid	01.112	—
17	calcium hydroxide	calcium hydroxide	01.202	526
18	potassium hydroxide	potassium hydroxide	01.203	525
19	potassium carbonate	potassium carbonate	01.301	501i
20	sodium carbonate	sodium carbonate	01.302	500i
21	trisodium citrate	trisodium citrate	01.303	331iii
22	tripotassium citrate	tripotassium citrate	01.304	332ii
23	sodium sesquicarbonate	sodium sesquicarbonate	01.305	500iii
24	sodium dihydrogen citrate	sodium dihydrogen citrate	01.306	331i
25	potassium hydrogen	potassium hydrogen	01.307	501ii
26	<i>DL</i> -disodium malate	<i>DL</i> -disodium malate	01.309	—
27	calcium lactate	calcium lactate	01.310	327
28	sodium gluconate	sodium gluconate	01.312	576
29	potassium ferrocyanide	potassium ferrocyanide	02.001	536
30	silicon dioxide	silicon dioxide	02.004	551
31	calcium silicate	calcium silicate	02.009	552
32	polydimethyl siloxane	polydimethyl siloxane	03.007	900a
33	butylated hydroxyanisole	butylated hydroxyanisole	04.001	320
34	butylated hydroxytoluene	butylated hydroxytoluene	04.002	321
35	propyl gallate	propyl gallate	04.003	310
36	<i>D</i> -isoascorbic acid (erythorbic acid), sodium <i>D</i> -isoascorbic	<i>D</i> -isoascorbic acid (erythorbic acid), sodium <i>D</i> -isoascorbic	04.004 04.018	315 316
37	tea polyphenol (TP)	tea polyphenol (TP)	04.005	—
38	phytic acid (inositol hexaphosphoric acid)	phytic acid (inositol hexaphosphoric acid)	04.006	—
39	tertiary butylhydroquinone (TP)	tertiary butylhydroquinone (TP)	04.007	319
40	antioxidant of glycyrrhiza	antioxidant of glycyrrhiza	04.008	—
41	calcium ascorbate	calcium ascorbate	04.009	302
42	ascorbyl palmitate	ascorbyl palmitate	04.011	304
43	4-hexylresorcinol	4-hexylresorcinol	04.013	586
44	ascorbic acid	ascorbic acid	04.014	300
45	sodium ascorbate	sodium ascorbate	04.015	301
46	vitamin E (<i>dl</i> - α -tocopherol, <i>d</i> - α -tocopherol, mixed tocopherol concentrate)	vitamin E (<i>dl</i> - α -tocopherol, <i>d</i> - α -tocopherol, mixed tocopherol concentrate)	04.016	307
47	rosemary extract	rosemary extract	04.017	—

	and its salts (sodium methyl p-hydroxy benzoate, ethyl p-hydroxy benzoate, sodium ethyl p-hydroxy benzoate)	and its salts (sodium methyl p-hydroxy benzoate, ethyl p-hydroxy benzoate, sodium ethyl p-hydroxy benzoate)	17.007	214 215
89	calcium sulphate	calcium sulphate	18.001	516
90	calcium chloride	calcium chloride	18.002	509
91	magnesium chloride	magnesium chloride	18.003	511
92	disodium ethylene-diamine-tetra-ac etate	disodium ethylene-diamine-tetra-ac etate	18.005	386
93	disodium stannous citrate	disodium stannous citrate	18.006	—
94	glucono delta-lactone	glucono delta-lactone	18.007	575
95	alpha -cyclodextrin	alpha -cyclodextrin	18.011	457
96	gamma -cyclodextrin	gamma -cyclodextrin	18.012	458
97	maltitol and maltitol syrup	maltitol and maltitol syrup	19.005	965i 965ii
98	xylitol	xylitol	19.007	967
99	lactitol	lactitol	19.014	966
100	lo-han-kuo extract	lo-han-kuo extract	19.015	—
101	erythritol	erythritol	19.018	968
102	tamarind polysaccharide gum	tamarind polysaccharide gum	20.011	—
103	sodium carboxy methyl starch	sodium carboxy methyl starch	20.012	—
104	sodium starch phosphate	sodium starch phosphate	20.013	—
105	acetylated distarch phosphate	acetylated distarch phosphate	20.015	1414
106	hydroxypropyl distarch phosphate	hydroxypropyl distarch phosphate	20.016	1442
107	phosphated distarch phosphate	phosphated distarch phosphate	20.017	1413
108	chitin	chitin	20.018	—
109	linseed gum	linseed gum	20.020	—
110	sesbania gum	sesbania gum	20.021	—
111	gellan gum	gellan gum	20.027	418
112	hydroxypropyl methyl cellulose	hydroxypropyl methyl cellulose	20.028	464
113	gleditsia sinensis lam gum	gleditsia sinensis lam gum	20.029	—
114	acetylated distarch adipate	acetylated distarch adipate	20.031	1422
115	acid treated starch	acid treated starch	20.032	1401

116	oxidized hydroxypropyl starch	oxidized hydroxypropyl starch	20.033	—
117	distarch phosphate	distarch phosphate	20.034	1412
118	sodium polyacrylate	sodium polyacrylate	20.036	—
119	starch acetate	starch acetate	20.039	1420
Note: All kinds of raw materials of food are allowed to be added into flavors used for food.				
^a Production strains are <i>Moniliella pollinis</i> , <i>Trichosporonides megachiliensis</i> , and <i>Candida lipolytica</i> respectively.				

Annex B

Inspection methods

B.1 Determination of color

B.1.1 Liquid flavors and slurry (paste)-state flavors

The sample and the standard sample are placed in the same-volume with-scale small beakers respectively, the volume is up to the scale. USE visual method to observe whether there is difference.

B.1.2 Powder flavors

PLACE the sample and the standard sample on a piece of clean white paper respectively. USE visual method to observe whether there is difference.

B.2 Determination of fragrance

B.2.1 Preparation of test solutions

According to the classification of flavored products, CHOOSE one of the following methods to prepare:

a) WEIGH 0.1g (accurate to 0.01g) of sample and standard sample respectively. PLACE in small beakers respectively. ADD sugar solution (prepared by 8g ~ 12g of sucrose, 0.10g ~ 0.16g of citric acid, and adding distilled water to 100mL) to prepare the aqueous solution containing 0.1% flavor. STIR evenly. That is the test solution;

b) WEIGH 0.2g ~ 0.5g (accurate to 0.01g) of sample and standard sample respectively. And PLACE in small beakers respectively. ADD saline solution (prepared by 0.5g of salt and adding boiled water to 100mL, then cool it) to prepare the saline solution containing 0.2% ~ 0.5% flavor. STIR evenly. That is the test solution;

c) WEIGH 0.1g (accurate to 0.01g) of sample and standard sample respectively. And PLACE in small beakers respectively. ADD 100mL of distilled water respectively to prepare the water solution containing 0.1% flavor. STIR evenly. That is the test solution;

B.2.2 Determination method

TASTE the test solution in sips respectively. DISTINGUISH whether there is difference in fragrance characteristics, strength, and taste. The test sample shall comply with the standard sample of same model. It shall gargle before each taste.

PUT the samples that have been stirred evenly into three centrifugal tubes, the volume is up to the scale. KEEP one tube for comparison. PUT two tubes into a centrifugal precipitator. CENTRIFUGE for 15min with a rotational speed of 2500 r/min ~ 3000 r/min, then take out. COMPARE with the comparison tube, they shall not be stratified.

B.6 Determination of thousand-fold dilution stability

Note: SELECT one of the following two methods to determine.

B.6.1 72h test (Arbitration method)

B.6.1.1 Instruments and equipment

B.6.1.1.1 1000mL volumetric flask.

B.6.1.1.2 Soda bottle.

B.6.1.1.3 Capping machine.

B.6.1.1.4 Balance: Accuracy is 0.01g.

B.6.1.2 Determination method

TAKE 1.0g of sample that has been stirred evenly, 80g ~ 120g of white sugar, 1.0g ~ 1.6g of citric acid, and 100mL of distilled water. HEAT to make them all dissolved. REMOVE to a volumetric flask after cooling. Then DILUTE with distilled water to the scale. That is the thousand-fold dilution.

TAKE about 300mL of thousand-fold dilution into a glass soda bottle. Then CAP it. PLACE horizontally at room temperature for 72h. OBSERVE the solution, the surface of which shall have no oil slick, the bottom shall have no precipitation.

B.6.2 Centrifugation test

B.6.2.1 Instruments and equipment

Centrifugal precipitators.

B.6.2.2 Determination methods

PUT the thousand-fold dilution in B.6.1.2 into three centrifugal tubes, the volume is up to the same scale. KEEP one tube for comparison; PUT two tubes into a centrifugal precipitator. CENTRIFUGE for 15min with a rotational speed of 3000 r/min, then take out. COMPARE with the comparison tube, the surface of solution shall have no oil slick, the bottom shall have no precipitation.

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