

DESCRIPTION

TITLE OF INVENTION:

PRODUCTION METHOD FOR FLAVOR COMPOSITION

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TECHNICAL FIELD

[0001] The present invention relates to a method for producing a flavor composition.

BACKGROUND ART

10 [0002] Due to diversification of preferences of consumers for food or beverage, there is a demand for development of food or beverage that meets the diversification of preferences. In addition, there is a demand for development of a flavor composition capable of reproducing feelings of eating and drinking real food or beverage. Along with such a trend of times, the development of a flavor composition having characteristics not present in products in the related art has been a problem.

15 [0003] In the related art, a flavor composition for food or beverage has been developed based on experience and sensitivity of flavorists skilled in evaluating a flavor composition with reference to results of an aroma analysis of food or beverage. As for the flavor analysis of food or beverage, an aroma concentrate is prepared by, for example, a method for collecting and concentrating aroma components floating in a headspace of food or beverage using an adsorbent, or a method for extracting aroma components from food or beverage with an organic solvent and then concentrating the aroma components by distillation treatment or the like, and is subjected to a gas chromatography analysis to obtain aroma component information.

20 [0004] As a common technique relating to a flavor composition for food or beverage, a method for focusing on a retronasal aroma, which is exhaled breath that escapes through the nose when the food or beverage as an analyte is eaten or drunk, has been known. For example, Patent Literatures 1 and 2 disclose a method for evaluating aroma expression characteristics by analyzing aroma components contained in exhaled breath using gas chromatography or the like and a method for searching for aroma components to provide a unique characterization. Patent Literature 3 proposes a method in which an aroma component remaining in saliva after drinking beverages is defined as a "lingering aroma", and a flavor composition blended with a group of aroma components having a distinctive lingering aroma is added to impart thickness to beverages. Patent Literature 4 discloses a flavor blending method in which a flavor composition

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is separately added to an oral model environmental solution containing artificial saliva as a base and a non-oral environmental solution not containing artificial saliva, the volatilized aroma components are respectively collected and subjected to a component analysis, and a correction value is calculated based on the difference between the two to correct a composition ratio of the flavor composition.

CITATION LIST

PATENT LITERATURE

[0005] Patent Literature 1: JP2016-045156A

10 Patent Literature 2: JP2019-045243A

Patent Literature 3: JP2018-072210A

Patent Literature 4: JP2007-236233A

SUMMARY OF INVENTION

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TECHNICAL PROBLEM

[0006] However, in a method according to the related art as described above, processed food to which a flavor composition is added is often greatly different from the analyte in physical properties, and even if a flavor composition in which an aroma composition inherent in the analyte is reproduced is produced, it is difficult to evoke a feeling of eating the analyte during eating food or beverage scented with the flavor composition.

[0007] The present invention has been made in view of the above circumstances according to the related art, and an object of the present invention is to provide a method for producing a flavor composition, which is capable of evoking the feeling during eating or drinking an analyte during eating or drinking food or beverage scented with the produced flavor composition and by which a blending amount of aroma components can be adjusted based on scientific and objective data obtained using a person.

SOLUTION TO PROBLEM

30 [0008] As a result of diligent studies to solve the above problems, the present inventors have thought that by matching an aroma balance of a retronasal aroma during eating or drinking processed food to which a flavor composition is added and an aroma balance of a retronasal aroma during eating or drinking an analyte, the flavor during eating or drinking food or

beverage as the analyte can be evoked, have found that the above problems can be solved by analyzing, comparing, and mixing a plurality of aroma components contained in the retronasal aroma, and have completed the present invention.

[0009] That is, the present invention relates to the following <1> to <4>.

5 <1> A method for producing a flavor composition, the method including:

a step (1) of performing a gas chromatography analysis on a retronasal aroma obtained during eating or drinking an analyte;

a step (2) of obtaining, by calculating a detection rate t of each of a plurality of aroma components contained in the retronasal aroma in the step (1) based on a result of the gas chromatography analysis in the step (1), a first flavor composition containing the aroma components;

a step (3) of preparing a model food or beverage 1 containing the first flavor composition;

15 a step (4) of performing a gas chromatography analysis on a retronasal aroma obtained during eating or drinking the model food or beverage 1;

a step (5) of calculating a detection rate l of each of a plurality of aroma components contained in the retronasal aroma in the step (4) based on a result of the gas chromatography analysis in the step (4);

20 a step (6) of obtaining a second flavor composition by adjusting a composition of the first flavor composition to bring the detection rate l close to the detection rate t ; and

a step (7) of obtaining a final flavor composition having an aroma balance matching the detection rate t by repeating the same operations as the steps (3) to (6).

25 <2> The method for producing a flavor composition according to <1>, further including a step of performing a gas chromatography/olfactometry analysis on the retronasal aroma in the step (1) and causing the first flavor composition to contain a recognized aroma component.

<3> The method for producing a flavor composition according to <2>, in which the gas chromatography/olfactometry analysis includes a step of adjusting an odor intensity by using an aroma extract dilution analysis method.

30 <4> The method for producing a flavor composition according to any one of <1> to <3>, in which the steps (1) and (4) each include a step of adsorbing the retronasal aroma to an adsorbent and desorbing the adsorbed retronasal aroma.

ADVANTAGEOUS EFFECTS OF INVENTION

[0010] A method for producing a flavor composition according to the present invention is a method for producing a flavor composition capable of evoking the feeling during eating or drinking an analyte during eating or drinking food or beverage scented with the produced flavor composition, and a blending amount of aroma components can be adjusted based on scientific and objective data obtained using a person.

DESCRIPTION OF EMBODIMENTS

[0011] Hereinafter, the present invention will be described in detail, but these are examples of preferred embodiments, and the present invention is not limited to these details.

[0012] A method for producing a flavor composition according to the present invention includes the following steps (1) to (7).

[0013] [Step (1)]

In step (1), a gas chromatography analysis is performed on a retronasal aroma obtained during eating or drinking an analyte. Before or after eating or drinking the analyte, the exhaled breath of a blank is analyzed, and the result can be subtracted in step (2) described below.

[0014] Examples of the analyte include food or beverage. The food or beverage may be a solid food or a beverage, and the kind thereof is not limited. Specific examples thereof include: fruits such as peaches, apples, grapes, strawberries, mangoes, pineapples, western pears, pears, kiwi, figs, oranges, lemons, melons, watermelons, and muscats; vegetables such as carrots, cucumbers, radishes, and corns; cooked and processed meats such as steak, grilled meat, hamburger, and ham; cooked seafood such as grilled fish, steamed shellfish, and sashimi; desserts such as ice cream, ice milk, lacto ice cream, frozen desserts, yogurt, pudding, jelly, and daily desserts; confections such as caramels, candies, compressed tablet candies, crackers, biscuits, cookies, pies, chocolates, snacks, and chewing gums; Japanese style confections such as red bean pastes, bean-jam bun, dango, and uiro; soups such as miso soup, Japanese style soup, and Western style soup; jams; spices and flavorings; various instant beverages; various instant foods; beverages such as carbonated beverages, soft beverages, fruit juice beverages, milk beverages, lactic acid bacteria beverages, energy beverages, soy milk, coffee, and tea beverages; alcoholic beverages such as beer, Chu-Hi, cocktails, sparkling wines, fruit wines, and herbal wines; stews such as beef stew and cream stew, sauces such as demi-glace sauce, oyster sauce, tomato sauce, and tartar sauce; rice, bread, pasta, curry rice, and hayashi rice.

[0015] Specifically, the retronasal aroma is an aroma component contained in the exhaled breath escaping from the oral cavity into the nasal cavity and expelled through the anterior nostril during eating or drinking an analyte such as food or beverage, and is closely related to the flavor felt by a person when actually eating or drinking the analyte such as food or beverage.

5 [0016] A method for obtaining the retronasal aroma is not particularly limited, and examples thereof include a method for capturing an aroma component expelled from a nostril using an adsorbent. At this time, the method further includes a step of adsorbing the retronasal aroma to the adsorbent and desorbing the adsorbed retronasal aroma. The desorption method is not particularly limited.

10 [0017] Examples of the adsorbent for aroma components include porous resin adsorbents such as weakly polar porous polymer beads based on 2,6-diphenyl-p-phenylene oxide.

[0018] A gas chromatography (GC) analysis is an analysis method for identifying and quantifying each component contained in an analysis target (gas such as exhaled breath), and can be performed using a general gas chromatography device. Gas chromatography/mass spectrometry (GC/MS) performed by a combination of a gas chromatograph device and a mass spectrometer is preferably used.

15 [0019] It is preferable that a gas chromatography/olfactometry (GC/O) analysis is performed on the retronasal aroma in step (1), and the recognized aroma component is contained in the first flavor composition described below.

20 [0020] GC/O is an analysis method in which a human nose sensation is combined with the gas chromatography analysis. Introduction of GC/O can be expected to obtain information on aroma components that are closer to the flavor felt when the analyte is actually eaten or drunk. That is, a person can detect a trace amount of aroma components and compensation is enabled by using GC/O in the case where the analyte contains a trace amount of aroma components which are difficult to detect by a gas chromatography analysis or gas chromatography/mass spectrometry.

25 [0021] In addition, GC/O may include a step of adjusting the odor intensity using an aroma extract dilution analysis (AEDA) method for stepwise adjusting an amount of the collected aroma components.

30 [0022] The aroma extract dilution analysis method is a method in which a sample is diluted to A^n times (A is any number, $n = 1, 2$, and $3 \cdots$), GC/O is repeatedly performed, and a flavor dilution (FD) factor which is a magnification at which an odor is not felt by the nose of an analyst is determined. A component with a higher FD factor is evaluated as contributing more

to the aroma of the sample.

[0023] [Step (2)]

In step (2), a detection rate t of each of a plurality of aroma components contained in the retronasal aroma in step (1) is calculated based on the result of the gas chromatography analysis in step (1) to obtain the first flavor composition containing the aroma components.

[0024] The result of the gas chromatography analysis is obtained in the form of an area of each aroma component contained in the retronasal aroma, that is, an integrated area of peaks of the aroma component. The detection rate t of each aroma component can be calculated based on the area of each aroma component. The first flavor composition may also be obtained by converting the detection rate t into mass% and mixing the aroma components having the converted mass% (content). The first flavor composition is not particularly limited as long as the aroma component group detected by the retronasal aroma in step (1) is contained.

[0025] [Step (3)]

In step (3), model food or beverage 1 containing the first flavor composition is prepared.

[0026] The content of the first flavor composition in the model food or beverage 1 is not particularly limited, and is, for example, 0.0001 mass% to 10 mass%, and preferably 0.001 mass% to 1.0 mass%.

[0027] In addition to the first flavor composition, the model food or beverage 1 may contain various compounds for reproducing the flavor of the analyte. A method for preparing the model food or beverage 1 is not particularly limited.

The model food or beverage 1 may be a solid food or a beverage.

[0028] [Step (4)]

In step (4), a gas chromatography analysis is performed on a retronasal aroma obtained during eating or drinking the model food or beverage 1. Before or after eating or drinking the model food or beverage 1, the exhaled breath of a blank is analyzed, and the result can be subtracted in step (5) described below.

[0029] That is, according to the present invention, instead of obtaining the food or beverage as a finished product by using the prepared first flavor composition, the tester eats or beverages the model food or beverage 1 again, and the obtained retronasal aroma is analyzed.

[0030] The retronasal aroma and the gas chromatography analysis are as described in step (1).

[0031] [Step (5)]

In step (5), a detection rate 1 of each of a plurality of aroma components contained in the retronasal aroma in step (4) is calculated based on the result of the gas chromatography analysis in step (4).

[0032] The result of the gas chromatography analysis in step (4) is obtained in the form of an area of each aroma component contained in the retronasal aroma in step (4), that is, an integrated area of peaks of the aroma component. The detection rate 1 of each aroma component can be calculated based on the area of each aroma component.

[0033] [Step (6)]

In step (6), the composition of the first flavor composition is adjusted so that the detection rate 1 approaches the detection rate t, thereby obtaining a second flavor composition.

[0034] In step (6), adjustment such as increasing an amount of an insufficient component and decreasing an amount of an excessive component in the aroma components of the first flavor composition is performed with reference to the detection rate t, that is, the balance of the aroma components of the retronasal aroma derived from the analyte. The food or beverage scented with the second flavor composition obtained through such adjustment has flavor closer to the original analyte than the food or beverage scented with the first flavor composition.

[0035] [Step (7)]

In step (7), the same operation as steps (3) to (6) is repeated to obtain a final flavor composition having an aroma balance matching the detection rate t.

[0036] In the case where an aroma balance of a flavor composition obtained through the preparation of the third flavor composition, the fourth flavor composition, the fifth flavor composition, etc. by repeating the same operation as steps (3) to (6) again based on the second flavor composition matches the aroma balance of each aroma component obtained in step (1), the obtained flavor composition is defined as the final flavor composition.

[0037] In the case where the aroma balance of the second flavor composition matches the aroma balance of the retronasal aroma derived from the analyte, the process is ended. The term "matches" in step (7) includes not only a complete match, but also a case where the flavor of the analyte and the flavor of the final flavor-scenting food or beverage are matched to the extent that is acceptable to a normal consumer.

[0038] In this way, a flavor composition can be prepared for flavor-scenting food or beverage with different matrices without relying too much on the sense of the flavorist. The flavor composition evokes the flavor of the analyte being eaten when the flavor-scenting food or beverage are eaten or drunk.

[0039] The flavor composition produced by the method for producing a flavor composition according to the present invention and food or beverage containing the flavor composition are produced after objectively evaluating whether the flavor balance when a target analyte is eaten or drunk can be reproduced. With this method, even if one is not an experienced flavorist, it is relatively easy to reproduce the flavor of the analyte being eaten in food or beverage with different matrices (processed food or beverage).

Examples

[0040] Next, the present invention will be described in more detail with reference to Examples, but the present invention is not limited to these Examples.

10 [0041] [Example 1] Production of apple-like flavor composition for beverages
<Collection of exhaled breath during eating apples>

Immediately before aroma collection, an internal standard substance (Nonan-5-one) was added to an aroma component adsorbent (TENAX TA: manufactured by GERSTEL K.K.), and the exhaled breath at the first breath taken during eating a bite-sized apple and after swallowing the bite-sized apple was sucked in with an air pump and adsorbed onto the aroma component adsorbent. The aroma was collected three times for GC/MS and once for GC/O. In addition, exhaled breath of a subject was collected in a state in which nothing was put in the oral cavity for the same time as the apple eating time, and the exhaled breath was defined as exhaled breath of a blank. The aroma was collected once for GC/MS and once for GC/O.

20 [0042] <Aroma analysis by GC/MS of exhaled breath during eating apples>

The aroma component adsorbent was purged with nitrogen (100 mL/min, 30 minutes), and then subjected to desorption by heating with a thermal desorption unit (TDU). Then, the obtained aroma components were introduced into a gas chromatograph ("GC6890NGC" manufactured by Agilent Technologies International Japan, Ltd.) equipped with a mass spectrometer, and a GC/MS analysis of exhaled breath during eating apples, and exhaled breath of the blank was performed to obtain a peak area value of each aroma component.

[0043] [Measurement device conditions]

TDU (Thermal Desorption Unit)

Temperature of desorption by heating: 250°C

30 Time of desorption by heating: 5 minutes

Temperature rise conditions: 30°C to 250°C, 720°C/min

CIS (Cooled Injection System)

Trap temperature: 10°C

Temperature rise conditions: 10°C to 150°C, 960°C/min, to 250°C, 720°C/min (hold for 15 minutes) GC (Gas Chromatography)

Column BC-WAX (manufactured by GL Sciences Inc., 0.25 mm i.d. × 50 m, film thickness: 0.15 µm)

5 Oven temp.: 40°C to 200°C, 4°C/ min, to 230°C, 20°C/min

Detector MS ("5977A" manufactured by Agilent Technologies International Japan, Ltd.)

[0044] <Aroma analysis by GC/O of exhaled breath during eating apples>

The aroma component adsorbent was purged with nitrogen (100 mL/min, 30 minutes),
10 then the aroma components were introduced into a gas chromatograph equipped with a GC-O port with a portable thermal desorber "Handy TD TD265" manufactured by GL Science Inc., and the GC/O analysis of the exhaled breath during eating apples and the exhaled breath of the blank was performed. As a result, there was no aroma component detected only by the GC/O analysis.

15 [0045] [Measurement device conditions]

TDU (Thermal Desorption Unit)

Temperature of desorption by heating: 250°C

Time of desorption by heating: 1.5 minutes

Temperature rise conditions: 40°C to 250°C, 2700°C/min

20 CIS (Cooled Injection System)

Trap temperature: 10°C

Temperature rise conditions: 10°C to 150°C, 960°C/ min, to 250°C, 720°C/min (hold for 15 minutes)

GC (Gas Chromatography)

25 Column BC-WAX (manufactured by GL Sciences Inc., 0.25 mm i.d. × 50 m, film thickness: 0.15 µm)

Oven temp.: 70°C to 230°C

Detector FID ("7980A" manufactured by Agilent Technologies International Japan, Ltd.)

30 [0046] <Preparation of first flavor composition (apple flavor A)>

An internal standard ratio was calculated based on an area value of each aroma component, which was detected by the GC/MS analysis of each compound in the exhaled breath during eating apples, and an area value of Nonan-5-one used as the internal standard substance.

Next, an internal standard ratio was calculated in the same manner for the exhaled breath of the blank, and was subtracted from the internal standard ratio during eating apples. The value was defined as the internal standard ratio of the retronasal aroma of the aroma component during eating apples. Next, a detection rate t with the total being 100% was calculated based on the internal standard ratio. Thereafter, the detection rate t was converted into mass%, and the aroma component was diluted with a solvent to obtain the formulation of the first flavor composition (apple flavor A). (Table 1)

[0047] <Preparation of model apple beverage 1>

The sugar and acid analysis of commercially available apples purchased in the season was performed, and a beverage dough having an adjusted sugar-acid ratio was prepared based on the result. A model apple beverage 1 scented with 0.1 mass% of the first flavor composition (apple flavor A) was prepared. In addition, a beverage not scented was prepared for a blank measurement.

[0048] <Collection of exhaled breath during drinking model apple beverage 1>

The exhaled breath during drinking the model apple beverage 1 and the blank beverage was collected by the same method as in the case of eating apples. The collection was performed three times in the case of the model apple beverage 1, and the collection was performed once in the case of the blank beverage.

[0049] <Aroma analysis by GC/MS of exhaled breath during drinking model apple beverage 1>

The GC/MS analysis of exhaled breath during drinking the model apple beverage 1 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during eating apples.

[0050] <Calculation of detection rate 1>

A detection rate 1 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model apple beverage 1, which was calculated by the same method as in <Preparation of first flavor composition (apple flavor A)>.

[0051] <Detection rate comparison and sensory evaluation>

As shown in Table 1, the aroma balance was significantly different when the detection rate t of the retronasal aroma during eating apples was compared with the detection rate 1 of the retronasal aroma during drinking the model apple beverage 1.

In addition, as a result of drinking the model apple beverage 1, the fresh flavor during eating apples was insufficient.

[0052] <Preparation of second flavor composition (apple flavor B)>

In order to bring the detection rate 1 close to the detection rate t, a calibration curve was created based on the internal standard ratios of the retronasal aroma during drinking the model apple beverage 1 and the formulations (%), and the formulations (%) of the second flavor composition (apple flavor B) were calculated based on the internal standard ratios of the retronasal aroma during eating apples (Table 1).

[0053] <Preparation of model apple beverage 2>

A model apple beverage 2 was prepared by scenting the above beverage dough with the second flavor composition (apple flavor B) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0054] <Collection of exhaled breath during drinking model apple beverage 2>

The collection of exhaled breath during drinking the model apple beverage 2 and the blank beverage was performed according to the same method as in the case of the model apple beverage 1.

[0055] <Aroma analysis by GC/MS of exhaled breath during drinking model apple beverage 2>

The GC/MS analysis of exhaled breath during drinking the model apple beverage 2 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model apple beverage 1.

[0056] <Calculation of detection rate 2>

A detection rate 2 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model apple beverage 2, which was calculated by the same method as in the case of the detection rate 1.

[0057] <Detection rate comparison and sensory evaluation>

As shown in Table 1, the aroma balance was slightly different when the detection rate t of the retronasal aroma during eating apples was compared with the detection rate 2 of the retronasal aroma during drinking the model apple beverage 2.

In addition, as a result of drinking the model apple beverage 2, the fresh flavor along with sweetness during eating apples was increased as compared with the model apple beverage 1, but was still insufficient.

[0058] <Preparation of third flavor composition (apple flavor C)>

In order to bring the detection rate 2 close to the detection rate t, a calibration curve was created based on the internal standard ratios of the retronasal aroma during drinking the

model apple beverage 1 and the model apple beverage 2 and the formulations (%), and the formulations (%) of the third flavor composition (apple flavor C) were calculated based on the internal standard ratios of the retronasal aroma during eating apples (Table 1).

[0059] <Preparation of model apple beverage 3>

5 A model apple beverage 3 was prepared by scenting the above beverage dough with the third flavor composition (apple flavor C) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0060] <Collection of exhaled breath during drinking model apple beverage 3>

The collection of exhaled breath during drinking the model apple beverage 3 and the
10 blank beverage was performed according to the same method as that during drinking the model apple beverage 1.

[0061] <Aroma analysis by GC/MS of exhaled breath during drinking model apple beverage 3>

The GC/MS analysis of exhaled breath during drinking the model beverage 3 and the
15 blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model apple beverage 1.

[0062] <Calculation of detection rate 3>

A detection rate 3 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model apple beverage 3, which was
20 calculated by the same method as in the case of the detection rate 1.

[0063] <Detection rate comparison and sensory evaluation>

As shown in Table 1, the aroma balance was similar when the detection rate t of the retronasal aroma during eating apples was compared with the detection rate 3 of the retronasal aroma during drinking the model apple beverage 3.

25 In addition, as a result of drinking the model apple beverage 3, the fresh and juicy flavor with sweetness during eating apples was evoked.

[0064] <Sensory evaluation by trained panelist>

First, four trained panelists performed sensory evaluation on the flavor during eating apples. Next, the flavor during drinking the model apple beverage 3 and the model apple
30 beverage 1 was subjected to sensory evaluation. The subjects were not informed of which flavoring was added to model apple beverage 3 and the model apple beverage 1, but a random three-digit numerical value was given and presented.

As a result, everyone answered that the model apple beverage 3 evoked the flavor

during eating apples as compared with the model apple beverage 1.

[0065] [Table 1]

Table 1. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating apples and drinking apple beverages

Aroma components	Retronasal aroma during eating apples		Apple flavor A	Retronasal aroma during drinking model apple beverage 1	
	Internal standard ratio	Detection rate t	Formulation	Internal standard ratio	Detection rate 1
Apple-1	22,975	31	3.5	70,589	45
Apple-2	8,214	11	1.3	19,468	13
Apple-3	7,562	10	0.85	5,604	3.6
Apple-4	7,068	9.6	0.60	2,238	1.4
Apple-5	6,640	9.0	0.76	19,655	13
Apple-6	2,817	3.8	0.30	2,571	1.7
Apple-7	2,496	3.4	0.28	4,570	2.9
Apple-8	1,962	2.7	0.12	3,435	2.2
Apple-9	1,577	2.1	0.26	3,323	2.1
Apple-10	1,323	1.8	0.070	1,327	0.86
Apple-11	1,273	1.7	0.080	1,695	1.1
Apple-12	1,094	1.5	0.18	3,215	2.1
Apple-13	1,075	1.5	0.25	499	0.32
Apple-14	845	1.1	0.10	1,539	0.99
Apple-15	843	1.1	0.10	2,450	1.6
Apple-16	615	0.83	0.080	1,961	1.3
Apple-17	615	0.83	0.10	1,344	0.87
Apple-18	574	0.78	0.090	2,629	1.7
Apple-19	536	0.73	0.090	1,767	1.1
Apple-20	513	0.70	0.10	209	0.13
Apple-21	408	0.55	0.090	1,351	0.87
Apple-22	291	0.39	0.040		
Apple-23	230	0.31	0.010	183	0.12
Apple-24	169	0.23	0.033	666	0.43
Apple-25	100	0.14	0.014	269	0.17
Apple-26	83	0.11	0.0060	20	0.013
Apple-27	71	0.10	0.010	194	0.13
Apple-28	67	0.090	0.0080	28	0.018
Apple-29	21	0.029	0.0080	121	0.078
Apple-30	19	0.026	0.010	119	0.077
Apple-others	1,624	2.2	0.40	2,167	1.4
Water-ethanol mixed solution			Remainder		

Table 1. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating apples and drinking apple beverages (Continued)

Aroma components	Apple flavor B	Retronasal aroma during drinking model apple beverage 2		Apple flavor C	Retronasal aroma during drinking model apple beverage 3	
	Formulation	Internal standard ratio	Detection rate 2	Formulation	Internal standard ratio	Detection rate 3
Apple-1	1.2	34,962	34	0.90	22,156	30
Apple-2	0.60	12,354	12	0.50	8,585	11
Apple-3	1.2	6,724	6.6	1.4	6,313	8.5
Apple-4	3.0	10,564	10	2.1	7,150	9.6
Apple-5	0.30	10,713	10	0.20	5,857	7.8
Apple-6	0.30	2,742	2.7	0.32	2,145	2.9
Apple-7	0.14	3,423	3.3	0.12	2,327	3.1
Apple-8	0.10	1,786	1.7	0.10	3,184	4.3
Apple-9	0.13	2,102	2.1	0.12	1,766	2.4
Apple-10	0.090	2,381	2.3	0.060	1,246	1.7
Apple-11	0.080	2,190	2.1	0.050	1,195	1.6
Apple-12	0.060	1,407	1.4	0.050	920	1.2
Apple-13	0.50	1,322	1.3	0.42	795	1.1
Apple-14	0.060	1,325	1.3	0.040	717	0.96
Apple-15	0.040	1,409	1.4	0.030	821	1.1
Apple-16	0.040	1,308	1.3	0.020	589	0.79
Apple-17	0.060	1,090	1.1	0.040	640	0.86
Apple-18	0.020	594	0.58	0.030	735	0.99
Apple-19	0.030	783	0.77	0.030	613	0.82
Apple-20	0.24	681	0.67	0.20	636	0.85
Apple-21	0.030	605	0.59	0.030	517	0.69
Apple-22	0.020			0.040	453	0.61
Apple-23	0.010	224	0.22	0.010	186	0.25
Apple-24	0.0080	202	0.20	0.0080	152	0.20
Apple-25	0.0050	150	0.15	0.0040	94	0.13
Apple-26	0.020	20	0.020	0.080	7	0.010
Apple-27	0.0040	91	0.089	0.0040	71	0.10
Apple-28	0.020	89	0.087	0.020	54	0.072
Apple-29	0.0030	158	0.15	0.00040	9	0.012
Apple-30	0.0020	40	0.039	0.0020	30	0.041
Apple-others	0.98	895	0.874	2.2	4,697	6.3
Water-ethanol mixed solution	Remainder			Remainder		

[0066] [Example 2] Production of grape-like flavor composition for beverages

<Collection of exhaled breath during eating grapes>

The exhaled breath during eating grapes was collected by the same method for apples.

5 [0067] <Aroma analysis by GC/MS of exhaled breath during eating grapes>

The GC/MS analysis of exhaled breath during eating grapes and exhaled breath of a blank was performed on the exhaled breath according to the same method and analysis conditions as those for the exhaled breath during eating apples.

[0068] <Aroma analysis by GC/O of exhaled breath during eating grapes>

10 The GC/O analysis of exhaled breath during eating grapes and exhaled breath of a

blank was performed on the exhaled breath according to the same method and analysis conditions as those for the exhaled breath during eating apples. As a result, the presence of aroma components that were not detected by GC/MS in the exhaled breath during eating grapes and an odor intensity thereof were confirmed.

5 [0069] <Preparation of first flavor composition (grape flavor A)>

An internal standard ratio of a retronasal aroma during eating grapes was calculated by the same method as in the case of apples, and then, the detection rate t with the total being 100% was calculated based on the internal standard ratio. Thereafter, the detection rate t was converted to mass%, the components detected only by the GC/O analysis were added to the components detected by GC/MS, and the mixture was further appropriately diluted with a solvent to obtain a formulation of a first flavor composition (grape flavor A). A formulation proportion of the components detected only by the GC/O analysis was the same as the lowest formulation value among the aroma components detected by GC/MS (Table 2).

[0070] <Preparation of model grape beverage 1>

15 The sugar and acid analysis of commercially available grapes purchased in the season was performed, and a beverage dough having an adjusted sugar-acid ratio was prepared based on the result. A model grape beverage 1 scented with 0.1 mass% of the first flavor composition (grape flavor A) was prepared. In addition, a beverage not scented was prepared for a blank measurement.

20 [0071] <Collection of exhaled breath during drinking model grape beverage 1>

The exhaled breath during drinking the model grape beverage 1 was collected three times for GC/MS, and collected once for GC/O according to the same method as in the case of the model apple beverage 1. In addition, the exhaled breath was collected once for GC/MS and once for GC/O according to the same method using a blank beverage.

25 [0072] <Aroma analysis by GC/MS of exhaled breath during drinking model grape beverage 1>

The GC/MS analysis of exhaled breath during drinking the model grape beverage 1 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during eating grapes.

30 [0073] <Aroma analysis by GC/O of exhaled breath during drinking model grape beverage 1>

The GC/O analysis of exhaled breath during drinking the model grape beverage 1 and the blank beverage was performed according to the same method and analysis conditions as

those for the exhaled breath during eating grapes. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during drinking the model grape beverage 1 and that the odor intensity was equivalent to that of the exhaled breath during eating grapes.

5 [0074] <Calculation of detection rate 1>

A detection rate 1 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model grape beverage 1, which was calculated by the same method as in <Preparation of first flavor composition (grape flavor A)>.

[0075] <Detection rate comparison and sensory evaluation>

10 As shown in Table 2, the aroma balance was significantly different when the detection rate t of the retronasal aroma during eating grapes was compared with the detection rate 1 of the retronasal aroma during drinking the model grape beverage 1.

In addition, as a result of drinking the model grape beverage 1, the fresh flavor during eating grapes was insufficient.

15 [0076] <Preparation of second flavor composition (grape flavor B)>

In order to bring the detection rate 1 close to the detection rate t, a calibration curve was created based on the internal standard ratio of the retronasal aroma during drinking the model grape beverage 1 and the formulation (%), a blending amount of each aroma component was calculated based on the internal standard ratio of the retronasal aroma during eating grapes, 20 the components detected only by the GC/O analysis were added in the same proportion as the previous time to the aroma components, and a formulation (%) of a second flavor composition (grape flavor B) was obtained (Table 2).

[0077] <Preparation of model grape beverage 2>

25 A model grape beverage 2 was prepared by scenting the above beverage dough with the second flavor composition (grape flavor B) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0078] <Collection of exhaled breath during drinking model grape beverage 2>

30 The collection of exhaled breath during drinking the model grape beverage 2 and the blank beverage was performed according to the same method as in the case of the model grape beverage 1.

[0079] <Aroma analysis by GC/MS of exhaled breath during drinking model grape beverage 2>

The GC/MS analysis of exhaled breath during drinking the model grape beverage 2

and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model grape beverage 1.

[0080] <Aroma analysis by GC/O of exhaled breath during drinking model grape beverage 2>

5 The GC/O analysis of exhaled breath during drinking the model grape beverage 2 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model grape beverage 1. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during drinking the model grape beverage 2 and that the odor intensity was equivalent to that
10 of the exhaled breath during eating grapes.

[0081] <Calculation of detection rate 2>

A detection rate 2 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model grape beverage 2, which was calculated by the same method as in the case of the detection rate 1.

15 [0082] <Detection rate comparison and sensory evaluation>

As shown in Table 2, the aroma balance was slightly different when the detection rate t of the retronasal aroma during eating grapes was compared with the detection rate 2 of the retronasal aroma during drinking the model grape beverage 2.

In addition, as a result of drinking the model grape beverage 2, the fresh flavor along
20 with sweetness during eating grapes was increased as compared with the model grape beverage 1, but was still insufficient.

[0083] <Preparation of third flavor composition (grape flavor C)>

In order to bring the detection rate 2 close to the detection rate t, a calibration curve was created based on the internal standard ratio of the retronasal aroma during drinking the
25 model grape beverage 1 and the model grape beverage 2 and the formulation (%), a blending amount of each aroma component was calculated based on the internal standard ratio of the retronasal aroma during eating grapes, the components detected only by the GC/O analysis were added in the same proportion as the previous time to the aroma components, and a formulation (%) of a third flavor composition (grape flavor C) was obtained. (Table 2)

30 [0084] <Preparation of model grape beverage 3>

A model grape beverage 3 was prepared by scenting the above beverage dough with the third flavor composition (grape flavor C) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0085] <Collection of exhaled breath during drinking model grape beverage 3>

The collection of exhaled breath during drinking the model grape beverage 3 and the blank beverage was performed according to the same method as in the case of the model grape beverage 1.

5 [0086] <Aroma analysis by GC/MS of exhaled breath during drinking model grape beverage 3>

The GC/MS analysis of exhaled breath of the model grape beverage 3 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model grape beverage 1.

10 [0087] <Aroma analysis by GC/O of exhaled breath during drinking model grape beverage 3>

The GC/O analysis of exhaled breath of the model grape beverage 3 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model grape beverage 1. As a result, it was confirmed that
15 components detected only by a GC/O analysis were present in the exhaled breath during drinking the model grape beverage 3 and that the odor intensity was equivalent to that of the exhaled breath during eating grapes.

[0088] <Calculation of detection rate 3>

A detection rate 3 with the total being 100% was calculated based on an internal
20 standard ratio of the retronasal aroma during drinking the model grape beverage 3, which was calculated by the same method as in the case of the detection rate 1.

[0089] <Detection rate comparison and sensory evaluation>

As shown in Table 2, the aroma balance was similar when the detection rate t of the retronasal aroma during eating grapes was compared with the detection rate 3 of the retronasal
25 aroma during drinking the model grape beverage 3.

In addition, as a result of drinking the model grape beverage 3, the fresh and juicy flavor with fiber feels and sweetness during eating grapes was evoked.

[0090] <Sensory evaluation by trained panelist>

First, four trained panelists performed sensory evaluation on the flavor during eating
30 grapes. Next, the flavor during drinking the model grape beverage 3 and the model grape beverage 1 was subjected to sensory evaluation. The subjects were not informed of which flavoring was added to model grape beverage 3 and the model grape beverage 1, but a random three-digit numerical value was given and presented.

As a result, everyone answered that the model grape beverage 3 evoked the flavor during eating grapes as compared with the model grape beverage 1.

[0091] [Table 2]

Table 2. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating grapes and drinking grape beverages

Aroma components	Retronasal aroma during eating grapes		Grape flavor A	Retronasal aroma during drinking model grape beverage 1	
	Internal standard ratio	Detection rate t	Formulation	Internal standard ratio	Detection rate 1
Grape-1	205,947	93	37.3	163,775	82
Grape-2	2,869	1.3	0.52	9,495	4.8
Grape-3	2,796	1.3	0.50	10,973	5.5
Grape-4	886	0.40	0.16	58	0.029
Grape-5	777	0.35	0.14	2,643	1.3
Grape-6	650	0.29	0.12	3,015	1.5
Grape-7	589	0.27	0.11	1,896	0.95
Grape-8	556	0.25	0.10	576	0.29
Grape-9	519	0.24	0.10	176	0.088
Grape-10	491	0.22	0.090	567	0.28
Grape-11	360	0.16	0.070	479	0.24
Grape-12	277	0.13	0.050	2,056	1.0
Grape-13	270	0.12	0.050	176	0.088
Grape-14	214	0.10	0.0040	55	0.028
Grape-15	204	0.093	0.040	887	0.45
Grape-16	110	0.050	0.020	559	0.28
Grape-17	85	0.039	0.015	4	0.0018
Grape-18	79	0.036	0.014	212	0.11
Grape-19	74	0.033	0.013		
Grape-20	58	0.026	0.010	222	0.11
Grape-21	53	0.024	0.010	187	0.094
Grape-22	53	0.024	0.010	374	0.19
Grape-others	2,794	1.3	0.52	865	0.43
Water-ethanol mixed solution			Remainder		

Table 2. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating grapes and drinking grape beverages (Continued)

Aroma components	Grape flavor B	Retronasal aroma during drinking model grape beverage 2		Grape flavor C	Retronasal aroma during drinking model grape beverage 3	
	Formulation	Internal standard ratio	Detection rate 2	Formulation	Internal standard ratio	Detection rate 3
Grape-1	42.4	143,631	87	36	143,194	94
Grape-2	0.35	4,660	2.8	0.12	1,452	0.95
Grape-3	0.24	7,603	4.6	0.060	1,961	1.3
Grape-4	0.80	201	0.12	2.1	637	0.42
Grape-5	0.080	1,502	0.91	0.024	547	0.36
Grape-6	0.050	837	0.51	0.024	629	0.41
Grape-7	0.060	674	0.41	0.030	478	0.31
Grape-8	0.10	964	0.58	0.036	858	0.56
Grape-9	0.50	364	0.22	0.36	317	0.21
Grape-10	0.10	698	0.42	0.048	343	0.23
Grape-11	0.080	395	0.24	0.048	202	0.13
Grape-12	0.010	348	0.21	0.0048	247	0.16
Grape-13	0.12	469	0.28	0.048	354	0.23
Grape-14	0.020	68	0.041	0.030	107	0.071
Grape-15	0.020	523	0.32	0.0048	149	0.10
Grape-16	0.0080	319	0.19	0.0024	121	0.079
Grape-17	0.12	300	0.18	0.024	96	0.063
Grape-18	0.0080	127	0.077	0.0030	62	0.041
Grape-19	0.080			0.12	50	0.033
Grape-20	0.010	206	0.13	0.0018	89	0.058
Grape-21	0.010	216	0.13	0.0018	46	0.030
Grape-22	0.0040	270	0.16	0.0006	87	0.057
Grape-others	1.1	508	0.31	0.55	191	0.13
Water-ethanol mixed solution	Remainder			Remainder		

[0092] [Example 3] Production of peach-like flavor composition for beverages

<Collection of exhaled breath during eating peaches>

The exhaled breath during eating peaches was collected by the same method for
5 apples.

[0093] <Aroma analysis by GC/MS of exhaled breath during eating peaches>

The GC/MS analysis of exhaled breath during eating peaches and exhaled breath of a blank was performed according to the same method and analysis conditions as those for the exhaled breath during eating apples.

10 [0094] <Aroma analysis by GC/O of exhaled breath during eating peaches>

The GC/O analysis of exhaled breath during eating peaches and exhaled breath of a blank was performed according to the same method and analysis conditions as those for the exhaled breath during eating apples. As a result, the presence of aroma components that were not detected by GC/MS in the exhaled breath during eating peaches and an odor intensity
15 thereof were confirmed.

[0095] <Preparation of first flavor composition (peach flavor A)>

An internal standard ratio of a retronasal aroma during eating peaches was calculated by the same method as in the case of apples, and then, the detection rate t with the total being 100% was calculated based on the internal standard ratio. Thereafter, the detection rate t was converted to mass%, the components detected only by the GC/O analysis were added thereto, and the mixture was further appropriately diluted with a solvent to obtain a formulation of a first flavor composition (peach flavor A). A formulation proportion of the components detected only by the GC/O analysis was the same as the lowest formulation value among the aroma components detected by GC/MS. (Table 3)

10 [0096] <Preparation of model peach beverage 1>

The sugar and acid analysis of commercially available peaches purchased in the season was performed, and a beverage dough having an adjusted sugar-acid ratio was prepared based on the result. A model peach beverage 1 scented with 0.1 mass% of the first flavor composition (peach flavor A) was prepared. In addition, a beverage not scented was prepared for a blank measurement.

[0097] <Collection of exhaled breath during drinking model peach beverage 1>

The collection of exhaled breath during drinking the model peach beverage 1 and the blank beverage was performed according to the same method as in the case of the model grape beverage 1.

20 [0098] <Aroma analysis by GC/MS of exhaled breath during drinking model peach beverage 1>

The GC/MS analysis of exhaled breath during drinking the model peach beverage 1 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during eating peaches.

25 [0099] <Aroma analysis by GC/O of exhaled breath during drinking model peach beverage 1>

The GC/O analysis of exhaled breath during drinking the model peach beverage 1 and the blank beverage was performed according to the same method and analysis conditions as GC/O of the exhaled breath during eating peaches. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during drinking the model peach beverage 1 and that the odor intensity was equivalent to that of the exhaled breath during eating peaches.

[0100] <Calculation of detection rate 1>

A detection rate 1 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model peach beverage 1, which was calculated by the same method as in <Preparation of first flavor composition (peach flavor A)>.

[0101] <Detection rate comparison and sensory evaluation>

As shown in Table 3, the aroma balance was significantly different when the detection rate t of the retronasal aroma during eating peaches was compared with the detection rate 1 of the retronasal aroma during drinking the model peach beverage 1.

In addition, as a result of drinking the model peach beverage 1, the fresh flavor during eating peaches was insufficient.

[0102] <Preparation of second flavor composition (peach flavor B)>

In order to bring the detection rate 1 close to the detection rate t, a calibration curve was created based on the internal standard ratio during drinking the model peach beverage 1 and the formulation (%), a blending amount of each aroma component was calculated based on the internal standard ratio during eating peaches, the components detected only by the GC/O analysis were added in the same proportion as the previous time to the aroma components, and a formulation (%) of a second flavor composition (peach flavor B) was obtained. (Table 3)

[0103] <Preparation of model peach beverage 2>

A model peach beverage 2 was prepared by scenting the above beverage dough with the second flavor composition (peach flavor B) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0104] <Collection of exhaled breath during drinking model peach beverage 2>

The collection of exhaled breath during drinking the model peach beverage 2 and the blank beverage was performed according to the same method as in the case of the model peach beverage 1.

[0105] <Aroma analysis by GC/MS of exhaled breath during drinking model peach beverage 2>

The GC/MS analysis of exhaled breath during drinking the model peach beverage 2 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model peach beverage 1.

[0106] <Aroma analysis by GC/O of exhaled breath during drinking model peach beverage 2>

The GC/O analysis of exhaled breath during drinking the model peach beverage 2 and the blank beverage was performed according to the same method and analysis conditions

as those for the exhaled breath during drinking the model peach beverage 1. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during drinking the model peach beverage 2 and that the odor intensity was equivalent to that of the exhaled breath during eating peaches.

5 [0107] <Calculation of detection rate 2>

A detection rate 2 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model peach beverage 2, which was calculated by the same method as in the case of the detection rate 1.

[0108] <Detection rate comparison and sensory evaluation>

10 As shown in Table 3, the aroma balance was slightly different when the detection rate t of the retronasal aroma during eating peaches was compared with the detection rate 2 of the retronasal aroma during drinking the model peach beverage 2.

In addition, as a result of drinking the model peach beverage 2, the fresh flavor during eating peaches was increased as compared with the model peach beverage 1, but was still
15 insufficient.

[0109] <Preparation of third flavor composition (peach flavor C)>

In order to bring the detection rate 2 close to the detection rate t, a calibration curve was created based on the internal standard ratios during drinking the model peach beverage 1 and during drinking the model peach beverage 2 and the formulation (%), a blending amount
20 of each aroma component was calculated based on the internal standard ratio during eating peaches, the components detected only by the GC/O analysis were added in the same proportion as the previous time to the aroma components, and a formulation (%) of a third flavor composition (peach flavor C) was obtained. (Table 3)

[0110] <Preparation of model peach beverage 3>

25 A model peach beverage 3 was prepared by scenting the above beverage dough with the third flavor composition (peach flavor C) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0111] <Collection of exhaled breath during drinking model peach beverage 3>

The collection of exhaled breath during drinking the model peach beverage 3 and the
30 blank beverage was performed according to the same method as in the case of the model peach beverage 1.

[0112] <Aroma analysis by GC/MS of exhaled breath during drinking model peach beverage 3>

The GC/MS analysis of exhaled breath during drinking the model peach beverage 3 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model peach beverage 1.

[0113] <Aroma analysis by GC/O of exhaled breath during drinking model peach beverage 3>

The GC/O analysis of exhaled breath during drinking the model peach beverage 3 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model peach beverage 1. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during drinking the model peach beverage 3 and that the odor intensity was equivalent to that of the exhaled breath during eating peaches.

[0114] <Calculation of detection rate 3>

A detection rate 3 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model peach beverage 3, which was calculated by the same method as in the case of the detection rate 1.

[0115] <Detection rate comparison and sensory evaluation>

As shown in Table 3, the aroma balance was similar when the detection rate t of the retronasal aroma during eating peaches was compared with the detection rate 3 of the retronasal aroma during drinking the model peach beverage 3.

In addition, as a result of drinking the model peach beverage 3, the fresh and juicy flavor with a smooth fleshy texture during eating peaches was evoked.

[0116] <Sensory evaluation by trained panelist>

First, four trained panelists performed sensory evaluation on the flavor during eating peaches. Next, the flavor during drinking the model peach beverage 3 and the model peach beverage 1 was subjected to sensory evaluation. The subjects were not informed of which flavoring was added to model peach beverage 3 and the model peach beverage 1, but a random three-digit numerical value was given and presented.

As a result, everyone answered that the model peach beverage 3 evoked the flavor during eating peaches as compared with the model peach beverage 1.

[0117] [Table 3]

Table 3. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating peaches and drinking peach beverages

Aroma components	Retronasal aroma during eating peaches		Peach flavor A	Retronasal aroma during drinking model peach beverage 1	
	Internal standard ratio	Detection rate t (%)	Formulation	Internal standard ratio	Detection rate 1 (%)
Peach-1	14,073	37	3.7	95,218	39
Peach-2	4,698	12	1.2	50,424	21
Peach-3	4,212	11	1.1	35,009	14
Peach-4	3,650	9.5	1.0	27,449	11
Peach-5	2,515	6.5	0.66	17,471	7.2
Peach-6	2,501	6.5	0.65	1,126	0.46
Peach-7	1,604	4.2	0.42	2,222	0.92
Peach-8	1,372	3.6	0.36	285	0.12
Peach-9	585	1.5	0.15	3,224	1.3
Peach-10	426	1.1	0.14	74	0.031
Peach-11	345	0.90	0.090	1,334	0.55
Peach-12	220	0.57	0.060	1,758	0.73
Peach-13	200	0.52	0.050	202	0.083
Peach-others	2,115	5.5	0.62	6,479	2.7
Water-ethanol mixed solution			Remainder		

Table 3. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating peaches and drinking peach beverages (Continued)

Aroma components	Peach flavor B	Retronasal aroma during drinking model peach beverage 2		Peach flavor C	Retronasal aroma during drinking model peach beverage 3	
	Formulation	Internal standard ratio	Detection rate 2 (%)	Formulation	Internal standard ratio	Detection rate 3 (%)
Peach-1	0.28	11,690	39	0.26	4,495	37
Peach-2	0.060	3,881	13	0.056	1,467	12
Peach-3	0.065	2,778	9.2	0.072	1,111	9.0
Peach-4	0.070	2,739	9.1	0.072	1,479	12
Peach-5	0.050	2,373	7.8	0.044	676	5.5
Peach-6	0.70	1,897	6.3	0.80	968	7.9
Peach-7	0.15	1,463	4.8	0.13	493	4.0
Peach-8	0.80	699	2.3	1.4	529	4.3
Peach-9	0.014	759	2.5	0.0080	136	1.1
Peach-10	0.40	240	0.79	0.60	84	0.69
Peach-11	0.012	186	0.62	0.014	73	0.59
Peach-12	0.0040	202	0.67	0.0032	106	0.86
Peach-13	0.025	75	0.25	0.020	58	0.47
Peach-others	0.72	1,262	4.2	0.63	608	4.9
Water-ethanol mixed solution	Remainder			Remainder		

[0118] [Example 4] Production of strawberry-like flavor composition for beverages

<Collection of exhaled breath during eating strawberries>

5 The exhaled breath during eating strawberries was collected by the same method for apples.

[0119] <Aroma analysis by GC/MS of exhaled breath during eating strawberries>

The GC/MS analysis of exhaled breath during eating peaches and exhaled breath of

a blank was performed according to the same method and analysis conditions as those for the exhaled breath during eating of strawberries.

[0120] <Aroma analysis by GC/O of exhaled breath during eating strawberries>

The GC/O analysis of exhaled breath during eating peaches and exhaled breath of a blank was performed according to the same method and analysis conditions as those for the exhaled breath during eating of strawberries. As a result, the presence of aroma components that were not detected by GC/MS in the exhaled breath during eating strawberries and an odor intensity thereof were confirmed.

[0121] <Preparation of first flavor composition (strawberry flavor A)>

An internal standard ratio of a retronasal aroma during eating strawberries was calculated by the same method as in the case of apples, and then, the detection rate t with the total being 100% was calculated based on the internal standard ratio (Table 4). Thereafter, the detection rate t was converted to mass%, the components detected only by the GC/O analysis were added thereto, and the mixture was further appropriately diluted with a solvent to obtain a formulation of a first flavor composition (strawberry flavor A). A formulation proportion of the components detected only by the GC/O analysis was the same as the lowest formulation value among the aroma components detected by GC/MS.

[0122] <Preparation of model strawberry beverage 1>

The sugar and acid analysis of commercially available strawberries purchased in the season was performed, and a beverage dough having an adjusted sugar-acid ratio was prepared based on the result. A model strawberry beverage 1 scented with 0.1 mass% of the first flavor composition (strawberry flavor A) was prepared. The model strawberry beverage 1 had a strong smell of sulfur-containing compounds and was unsuitable for drinking.

[0123] <Preparation of model strawberry beverage 2>

A second flavor composition (strawberry flavor B) shown in Table 4, which contains aroma components detected by exhaled breath analysis during eating strawberries, was used instead of the strawberry flavor A. A model strawberry beverage 2 was prepared by scenting the above beverage dough with the second flavor composition (strawberry flavor B) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0124] <Collection of exhaled breath during drinking model strawberry beverage 2>

The collection of exhaled breath during drinking the model strawberry beverage 2 and the blank beverage was performed according to the same method as in the case of the model

grape beverage 1.

[0125] <Aroma analysis by GC/MS of exhaled breath during drinking model strawberry beverage 2>

The GC/MS analysis of exhaled breath during drinking the model strawberry beverage 2 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during eating strawberries.

[0126] <Aroma analysis by GC/O of exhaled breath during drinking model strawberry beverage 2>

The GC/O analysis of exhaled breath during drinking the model strawberry beverage 2 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during eating strawberries. As a result, the presence of a component detected only by the GC/O analysis in the exhaled breath during drinking the model strawberry beverage 2 was not confirmed.

[0127] <Calculation of detection rate 2>

A detection rate 2 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model strawberry beverage 2, which was calculated by the same method as in <Preparation of first flavor composition (strawberry flavor A)>.

[0128] <Detection rate comparison and sensory evaluation>

As shown in Table 4, the aroma balance was significantly different when the detection rate t of the retronasal aroma during eating strawberries was compared with the detection rate 2 of the retronasal aroma during drinking the model strawberry beverage 2.

In addition, as a result of drinking the model strawberry beverage 2, the fresh flavor during eating strawberries was insufficient.

[0129] <Preparation of third flavor composition (strawberry flavor C)>

In order to bring the detection rate 2 close to the detection rate t , a calibration curve was created based on the internal standard ratio of the retronasal aroma during drinking the model strawberry beverage 2 and the formulation (%), a blending amount of each aroma component was calculated based on the internal standard ratio of the retronasal aroma during eating strawberries, the components detected only by the GC/O analysis were added in a proportion higher than that of the previous time to the aroma components, and a formulation (%) of a third flavor composition (strawberry flavor C) was obtained. (Table 4)

[0130] <Preparation of model strawberry beverage 3>

A model strawberry beverage 3 was prepared by scenting the above beverage dough with the third flavor composition (strawberry flavor C) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0131] <Collection of exhaled breath during drinking model strawberry beverage 3>

5 The collection of exhaled breath during drinking the model strawberry beverage 3 and the blank beverage was performed according to the same method as in the case of the model strawberry beverage 2.

[0132] <Aroma analysis by GC/MS of exhaled breath during drinking model strawberry beverage 3>

10 The GC/MS analysis of exhaled breath during drinking the model strawberry beverage 3 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model strawberry beverage 2.

[0133] <Aroma analysis by GC/O of exhaled breath during drinking model strawberry beverage 3>

15 The GC/O analysis of exhaled breath during drinking the model strawberry beverage 3 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model strawberry beverage 2. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during drinking the model strawberry beverage 3 and that the odor intensity was
20 equivalent to that of the exhaled breath during eating strawberries.

[0134] <Calculation of detection rate 3>

A detection rate 3 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model strawberry beverage 3, which was calculated by the same method as in the case of the detection rate 2.

25 [0135] <Detection rate comparison and sensory evaluation>

As shown in Table 4, the aroma balance was slightly different when the detection rate t of the retronasal aroma during eating strawberries was compared with the detection rate 3 of the retronasal aroma during drinking the model strawberry beverage 3.

30 In addition, as a result of drinking the model strawberry beverage 3, the fresh flavor along with sweetness during eating an apple was increased as compared with the model strawberry beverage 2, but was still insufficient.

[0136] <Preparation of fourth flavor composition (strawberry flavor D)>

In order to bring the detection rate 3 close to the detection rate t, a calibration curve

was created based on the internal standard ratio of the retronasal aroma during drinking the model strawberry beverage 2 and the model strawberry beverage 3 and the formulation (%), a blending amount of each aroma component was calculated based on the internal standard ratio of the retronasal aroma during eating strawberries, the components detected only by the GC/O analysis were added in the same proportion as the previous time to the aroma components, and a formulation (%) of a fourth flavor composition (strawberry flavor D) was obtained. (Table 4)

[0137] <Preparation of model strawberry beverage 4>

A model strawberry beverage 4 was prepared by scenting the above beverage dough with the fourth flavor composition (strawberry flavor D) in an amount of 0.1 mass%. In addition, a beverage not scented was prepared for a blank measurement.

[0138] <Collection of exhaled breath during drinking model strawberry beverage 4>

The collection of exhaled breath during drinking the model strawberry beverage 4 and the blank beverage was performed according to the same method as in the case of the model strawberry beverage 2.

[0139] <Aroma analysis by GC/MS of exhaled breath during drinking model strawberry beverage 4>

The GC/MS analysis of exhaled breath during drinking the model strawberry beverage 4 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model strawberry beverage 2.

[0140] <Aroma analysis by GC/O of exhaled breath during drinking model strawberry beverage 4>

The GC/O analysis of exhaled breath during drinking the model strawberry beverage 4 and the blank beverage was performed according to the same method and analysis conditions as those for the exhaled breath during drinking the model strawberry beverage 2. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during drinking the model strawberry beverage 4 and that the odor intensity was equivalent to that of the exhaled breath during eating strawberries.

[0141] <Calculation of detection rate 4>

A detection rate 4 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during drinking the model strawberry beverage 4, which was calculated by the same method as in the case of the detection rate 2.

[0142] <Detection rate comparison and sensory evaluation>

As shown in Table 4, the aroma balance was similar when the detection rate t of the

retronasal aroma during eating strawberries was compared with the detection rate 4 of the retronasal aroma during drinking the model strawberry beverage 4.

In addition, as a result of drinking the model strawberry beverage 4, the fresh and juicy flavor with sweetness during eating strawberries was evoked.

5 [0143] <Sensory evaluation by trained panelist>

First, four trained panelists performed sensory evaluation on the flavor during eating strawberries. Next, the flavor during drinking the model strawberry beverage 4 and the model strawberry beverage 2 was subjected to sensory evaluation. The subjects were not informed of which flavoring was added to model strawberry beverage 4 and the model strawberry beverage 2, but a random three-digit numerical value was given and presented.

As a result, everyone answered that the model strawberry beverage 4 evoked the flavor during eating strawberries as compared with the model strawberry beverage 2.

[0144] [Table 4]

Table 4. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating strawberries and drinking strawberry beverages

Aroma components	Retronasal aroma during eating strawberries		Strawberry flavor B	Retronasal aroma during drinking model strawberry beverage 2	
	Internal standard ratio	Detection rate t (%)	Formulation	Internal standard ratio	Detection rate 2 (%)
Strawberry-1	2,445	31	0.80	17,206	8.3
Strawberry-2	1,422	18	4.0	126,986	61
Strawberry-3	696	8.9	0.16	2,317	1.1
Strawberry-4	467	6.0	0.24	1,551	0.74
Strawberry-5	460	5.9	0.080	888	0.43
Strawberry-6	412	5.3	0.16	5,126	2.5
Strawberry-7	410	5.2	0.16	7,077	3.4
Strawberry-8	407	5.2	0.080	1,700	0.82
Strawberry-9	248	3.2	0.080	2,449	1.2
Strawberry-10	188	2.4	0.080	3,512	1.7
Strawberry-11	151	1.9	0.80	28,467	14
Strawberry-12	140	1.8	1.6	730	0.35
Strawberry-13	83	1.1	0.24	8,557	4.1
Strawberry-14	75	0.95	0.0080	139	0.067
Strawberry-15	23	0.29	0.0016	143	0.069
Strawberry-others	206	2.6	5.0	1,420	0.68
Water-ethanol mixed solution			Remainder		

Table 4. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating strawberries and drinking strawberry beverages (Continued)

Aroma components	Strawberry flavor C	Retronasal aroma during drinking model strawberry beverage 3		Strawberry flavor D	Retronasal aroma during drinking model strawberry beverage 4	
	Formulation	Internal standard ratio	Detection rate 1 (%)	Formulation	Internal standard ratio	Detection rate 3 (%)
Strawberry-1	0.80	11,966	31	0.80	9,747	30
Strawberry-2	0.40	10,972	28	0.28	6,488	20
Strawberry-3	0.40	1,952	5.1	0.32	2,864	8.8
Strawberry-4	0.50	2,128	5.5	0.18	1,790	5.5
Strawberry-5	0.20	2,032	5.3	0.25	2,228	6.9
Strawberry-6	0.080	1,797	4.7	0.090	1,839	5.7
Strawberry-7	0.060	1,852	4.8	0.080	2,083	6.4
Strawberry-8	0.020	242	0.6	0.16	1,738	5.4
Strawberry-9	0.060	1,276	3.3	0.080	1,124	3.5
Strawberry-10	0.040	1,179	3.1	0.10	728	2.2
Strawberry-11	0.080	1,052	2.7	0.030	679	2.1
Strawberry-12	2.0	511	1.3	1.500	367	1.1
Strawberry-13	0.020	582	1.5	0.0	325	1.0
Strawberry-14	0.020	171	0.44	0.040	282	0.87
Strawberry-15	0.0020	117	0.30	0.0020	75	0.23
Strawberry-others	3.7	764	2.3	2.6	41	0.13
Water-ethanol mixed solution	Remainder			Remainder		

[0145] [Example 5] Production of strawberry-like flavor composition for gummy

The detection rate t of the retronasal aroma during eating strawberries as a target was obtained by the method shown in Example 4 (production of a strawberry-like flavor composition for beverages).

[0146] <Preparation of first flavor composition (strawberry flavor E)>

Based on the strawberry flavor D developed for the strawberry beverage, a strawberry flavor E with enhanced overall strength as a whole was prepared. (Table 5)

[0147] <Preparation of model strawberry gummy 1>

A model strawberry gummy 1 obtained by scenting a general dough formulation of gummy with a first flavor composition (strawberry flavor E) in an amount of 0.2 mass% was prepared. In addition, a gummy not scented was prepared for a blank measurement.

[0148] <Collection of exhaled breath during eating model strawberry gummy 1>

The exhaled breath during eating the model strawberry gummy 1 and a blank gummy was collected by the same method as in the case of eating strawberries.

[0149] <Aroma analysis by GC/MS of exhaled breath during eating model strawberry gummy 1>

The GC/MS analysis of exhaled breath during eating the model strawberry gummy 1 and a blank gummy was performed according to the same method and analysis conditions as

those for the exhaled breath during eating strawberries.

[0150] <Aroma analysis by GC/O of exhaled breath during eating model strawberry gummy 1>

The GC/O analysis of exhaled breath during eating the model strawberry gummy 1 and a blank gummy was performed according to the same method and analysis conditions as those for the exhaled breath during eating strawberries. As a result, the presence of aroma components that were not detected by GC/MS in the exhaled breath during eating the model strawberry gummy 1 was confirmed. It was confirmed that the odor intensity was stronger than that of the exhaled breath during eating strawberries.

[0151] <Calculation of detection rate 1>

A detection rate 1 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during eating the model strawberry gummy 1, which was calculated by the same method as in the case of the exhaled breath during eating strawberries.

[0152] <Detection rate comparison and sensory evaluation>

As shown in Table 5, the aroma balance was significantly different when the detection rate t of the retronasal aroma during eating strawberries was compared with the detection rate 1 of the retronasal aroma during eating the model strawberry gummy 1.

In addition, as a result of eating the model strawberry gummy 1, the fresh flavor during eating strawberries was insufficient.

[0153] <Preparation of second flavor composition (strawberry flavor F)>

In order to bring the detection rate 1 close to the detection rate t, a calibration curve was created based on the internal standard ratio of the retronasal aroma during eating the model strawberry gummy 1 and the formulation (%), a blending amount of each aroma component was calculated based on the internal standard ratio of the retronasal aroma during eating strawberries, the components detected only by the GC/O analysis were added in a proportion lower than that of the previous time to the aroma components, and a formulation (%) of a second flavor composition (strawberry flavor F) was obtained. (Table 5)

[0154] <Preparation of model strawberry gummy 2>

A model strawberry gummy 2 was prepared by scenting the above gummy dough with the second flavor composition (strawberry flavor F) in an amount of 0.2 mass%. In addition, a gummy not scented was prepared for a blank measurement.

[0155] <Collection of exhaled breath during eating model strawberry gummy 2>

The collection of exhaled breath during eating the model strawberry gummy 2 and

the blank gummy was performed according to the same method as in the case of the model strawberry gummy 1.

[0156] <Aroma analysis by GC/MS of exhaled breath during eating model strawberry gummy 2>

5 The GC/MS analysis of exhaled breath during eating the model strawberry gummy 2 and a blank gummy was performed according to the same method and analysis conditions as those for the exhaled breath during eating the model strawberry gummy 1.

[0157] <Aroma analysis by GC/O of exhaled breath during eating model strawberry gummy 2>

10 The GC/O analysis of exhaled breath during eating the model strawberry gummy 2 and a blank gummy was performed according to the same method and analysis conditions as those for the exhaled breath during eating the model strawberry gummy 1. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during eating the model strawberry gummy 2 and that the odor intensity was equivalent to that
15 of the exhaled breath during eating strawberries.

[0158] <Calculation of detection rate 2>

A detection rate 2 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during eating the model strawberry gummy 2, which was calculated by the same method as in the case of the detection rate 1.

20 [0159] <Detection rate comparison and sensory evaluation>

As shown in Table 5, the aroma balance was slightly different when the detection rate t of the retronasal aroma during eating strawberries was compared with the detection rate 2 of the retronasal aroma during eating the model strawberry gummy 2.

25 In addition, as a result of eating the model strawberry gummy 2, the fresh flavor along with sweetness during eating fruits was increased as compared with the model strawberry gummy 1, but was still insufficient.

[0160] <Preparation of third flavor composition (strawberry flavor G)>

30 In order to bring the detection rate 2 close to the detection rate t, a calibration curve was created based on the internal standard ratio of the retronasal aroma during eating the model strawberry gummy 1 and the model strawberry gummy 2 and the formulation (%), a blending amount of each aroma component was calculated based on the internal standard ratio of the retronasal aroma during eating strawberries, the components detected only by the GC/O analysis were added in the same proportion as the previous time to the aroma components, and

a formulation (%) of a second flavor composition (strawberry flavor G) was obtained. (Table 5)

[0161] <Preparation of model strawberry gummy 3>

A model strawberry gummy 3 was prepared by scenting the above gummy dough with the third flavor composition (strawberry flavor G) in an amount of 0.2 mass%. In addition, a gummy not scented was prepared for a blank measurement.

[0162] <Collection of exhaled breath during eating model strawberry gummy 3>

The collection of exhaled breath during eating the model strawberry gummy 3 and the blank gummy was performed according to the same method as in the case of the model strawberry gummy 1.

[0163] <Aroma analysis by GC/MS of exhaled breath during eating model strawberry gummy 3>

The GC/MS analysis of exhaled breath during eating the model strawberry gummy 3 and a blank gummy was performed according to the same method and analysis conditions as those for the exhaled breath during eating the model strawberry gummy 1.

[0164] <Calculation of detection rate 3>

A detection rate 3 with the total being 100% was calculated based on an internal standard ratio of the retronasal aroma during eating the model strawberry gummy 3, which was calculated by the same method as in the case of the detection rate 1.

[0165] <Aroma analysis by GC/O of exhaled breath during eating model strawberry gummy 3>

The GC/O analysis of exhaled breath during eating the model strawberry gummy 3 and a blank gummy was performed according to the same method and analysis conditions as those for the exhaled breath during eating the model strawberry gummy 1. As a result, it was confirmed that components detected only by a GC/O analysis were present in the exhaled breath during eating the model strawberry gummy 3 and that the odor intensity was equivalent to that of the exhaled breath during eating strawberries.

[0166] <Detection rate comparison and sensory evaluation>

As shown in Table 5, the aroma balance was similar when the detection rate t of the retronasal aroma during eating strawberries was compared with the detection rate 3 of the retronasal aroma during eating the model strawberry gummy 3.

In addition, as a result of eating the model strawberry gummy 3, the fresh and juicy flavor with sweetness during eating strawberries was evoked.

[0167] <Sensory evaluation by trained panelist>

First, four trained panelists performed sensory evaluation on the flavor during eating strawberries. Next, the flavor during eating the model strawberry gummy 3 and the model strawberry gummy 1 was subjected to sensory evaluation. The subjects were not informed of which flavoring was added to model strawberry gummy 3 and the model strawberry gummy 1, but a random three-digit numerical value was given and presented.

As a result, everyone answered that the model strawberry gummy 3 evoked the flavor during eating strawberries as compared with the model strawberry gummy 1.

[0168] [Table 5]

Table 5. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating strawberries and eating strawberry gummies

Aroma components	Retronasal aroma during eating strawberries		Strawberry flavor E	Retronasal aroma during eating strawberry gummy 1	
	Internal standard ratio	Detection rate t (%)	Formulation	Internal standard ratio	Detection rate 1 (%)
Strawberry-1	2,445	31	3.2	16,122	24
Strawberry-2	1,422	18	1.1	15,315	23
Strawberry-3	696	8.9	1.3	11,175	17
Strawberry-4	467	6.0	0.72	402	0.61
Strawberry-5	460	5.9	1.0	854	1.3
Strawberry-6	412	5.3	0.36	4,964	7.5
Strawberry-7	410	5.2	0.32	5,289	8.0
Strawberry-8	407	5.2	0.64	3,645	5.5
Strawberry-9	248	3.2	0.32	1,932	2.9
Strawberry-10	188	2.4	0.40	1,835	2.8
Strawberry-11	151	1.9	0.12	1,431	2.2
Strawberry-12	140	1.8	6.0	1,434	2.2
Strawberry-13	83	1.1	0.060	750	1.1
Strawberry-14	75	0.95	0.16	393	0.60
Strawberry-15	23	0.29	0.0080	75	0.11
Strawberry-others	206	2.6	8.2	432	0.65
Propylene glycol			Remainder		

Table 5. List of calculated values in flavor preparation process according to retronasal aroma analysis during eating strawberries and eating strawberry gummies (Continued)

Aroma components	Strawberry flavor F	Retronasal aroma during eating strawberry gummy 2		Strawberry flavor G	Retronasal aroma during eating strawberry gummy 3	
	Formulation	Internal standard ratio	Detection rate 2 (%)	Formulation	Internal standard ratio	Detection rate 3 (%)
Strawberry-1	2.5	38,964	39	1.6	47,607	29
Strawberry-2	0.50	16,495	16	0.40	27,928	17
Strawberry-3	0.50	8,160	8.2	0.40	12,894	7.9
Strawberry-4	1.8	3,066	3.1	2.6	23,144	14
Strawberry-5	1.0	4,893	4.9	0.96	7,320	4.5
Strawberry-6	0.15	4,214	4.2	0.15	9,188	5.6
Strawberry-7	0.13	6,065	6.1	0.080	6,072	3.7
Strawberry-8	0.35	7,120	7.1	0.20	8,016	4.9
Strawberry-9	0.15	3,226	3.2	0.12	5,393	3.3
Strawberry-10	0.050	1,624	1.6	0.060	4,378	2.7
Strawberry-11	0.050	1,630	1.6	0.048	3,110	1.9
Strawberry-12	3.0	1,363	1.4	3.0	2,860	1.8
Strawberry-13	0.035	1,019	1.0	0.030	1,953	1.2
Strawberry-14	0.15	1,354	1.4	0.080	1,399	0.86
Strawberry-15	0.0050	181	0.18	0.0048	424	0.26
Strawberry-others	3.9	639	0.64	4.1	1,283	0.79
Propylene glycol	Remainder			Remainder		

[0169] Although the present invention has been described in detail and with reference to specific embodiments, it will be apparent to those skilled in the art that various changes and modifications can be made without departing from the spirit and scope of the present invention.

- 5 This application is based on a Japanese Patent Application (No. 2022-067737) filed on April 15, 2022, the contents of which are incorporated herein as a reference.

CLAIMS

1. A method for producing a flavor composition, the method comprising:
a step (1) of performing a gas chromatography analysis on a retronasal aroma
5 obtained during eating or drinking an analyte;
a step (2) of obtaining, by calculating a detection rate t of each of a plurality of aroma components contained in the retronasal aroma in the step (1) based on a result of the gas chromatography analysis in the step (1), a first flavor composition containing the aroma components;
10 a step (3) of preparing a model food or beverage 1 containing the first flavor composition;
a step (4) of performing a gas chromatography analysis on a retronasal aroma obtained during eating or drinking the model food or beverage 1;
a step (5) of calculating a detection rate l of each of a plurality of aroma components
15 contained in the retronasal aroma in the step (4) based on a result of the gas chromatography analysis in the step (4);
a step (6) of obtaining a second flavor composition by adjusting a composition of the first flavor composition to bring the detection rate l close to the detection rate t ; and
a step (7) of obtaining a final flavor composition having an aroma balance matching
20 the detection rate t by repeating the same operations as the steps (3) to (6).
2. The method for producing a flavor composition according to claim 1, further comprising a step of performing a gas chromatography/olfactometry analysis on the retronasal aroma in the step (1) and causing the first flavor composition to contain an aroma component
25 of a recognized scent.
3. The method for producing a flavor composition according to claim 2, wherein the gas chromatography/olfactometry analysis includes an analysis of adjusting an odor intensity by using an aroma extract dilution analysis method.
30
4. The method for producing a flavor composition according to any one of claims 1 to 3, wherein the step (1) includes a step of adsorbing the retronasal aroma to an adsorbent and desorbing the adsorbed retronasal aroma.