DESCRIPTION

TITLE OF INVENTION: COMPOSITION, METHOD FOR PRODUCING SAME, AND METHOD FOR SUPPRESSING OFF-ODOR OF OILS AND FATS INCLUDING LINOLEIC ACID AS CONSTITUENT FATTY ACID

TECHNICAL FIELD

[0001]

The present invention relates to a composition containing a fat or oil that contains linoleic acid as a constituent fatty acid, and a method for producing the same. The present invention also relates to, for example, a method for suppressing an off-flavor of a fat or oil that contains linoleic acid as a constituent fatty acid.

BACKGROUND ART

[0002]

Linoleic acid is a type of unsaturated fatty acid. Linoleic acid is required for the normal functioning of body tissues, but is not synthesized in the human body and thus needs to be taken from food. Vegetable fats and oils contain linoleic acid as a constituent fatty acid and can provide energy to organisms, and are therefore frequently used in general foods and health foods having high nutritional value. For example, Patent Literature 1 discloses an oil- or fat-containing milk-flavored composition containing (A) a vegetable fat or oil, (B) one or more selected from the group consisting of C8-C20 fatty acids and hydrolysates of fats or oils, (C) a C6-C14 lactone, and (D) a C4-C13 ketone, wherein the amounts of the components (A), (B), (C), and (D) fall within respective specified ranges.

CITATION LIST

- Patent Literature

[0003]

Patent Literature 1: JP 2016-5451 A

SUMMARY OF INVENTION

- Technical Problem

[0004]

However, linoleic acid has a chemically unstable double bond and undergoes

radical reactions upon exposure to heat, oxygen, or light, thereby generating a characteristic off-flavor. In addition, linoleic acid, which is an unsaturated fatty acid, may undergo autoxidation. For this reason, during storage of a composition containing a fat or oil that contains linoleic acid as a constituent fatty acid, this fat or oil may deteriorate and generate an off-flavor (oily odor), thereby adversely affecting the flavor of the composition. Patent Literature 1 does not examine a method for suppressing an off-flavor, generated during storage, of a fat or oil that contains linoleic acid as a constituent fatty acid.

[0005]

The present invention aims to provide a composition in which, despite containing a fat or oil that contains linoleic acid as a constituent fatty acid, an off-flavor of the fat or oil generated during storage is suppressed, and also to provide a method for suppressing an off-flavor of a fat or oil that contains linoleic acid as a constituent fatty acid.

- Solution to Problem

[0006]

As a result of intensive studies performed to solve the above problem, the present inventors have found that incorporating indigestible dextrin and a flavor component into a composition containing a fat or oil that contains linoleic acid as a constituent fatty acid can suppress an off-flavor (oily odor) of the fat or oil generated during storage.

[0007]

In other words, the present invention includes, but is not limited to, the following composition, method for producing the composition, and method for suppressing an off-flavor of a fat or oil that contains linoleic acid as a constituent fatty acid.

(1) A composition containing: a fat or oil (A) that contains linoleic acid as a constituent fatty acid; indigestible dextrin (B); and a flavor component (C).

(2) The composition according to the clause (1), wherein the flavor component (C) is at least one selected from the group consisting of a coffee extract, matcha, and cocoa powder.

(3) The composition according to the clause (1) or (2), wherein a weight ratio of an amount of linoleic acid in terms of free linoleic acid to an amount of the indigestible dextrin (B) (linoleic acid/(B)) is 0.01 to 0.5.

(4) The composition according to any one of the clauses (1) to (3), wherein a weight ratio of an amount of linoleic acid in terms of free linoleic acid to an amount of the flavor component (C) (linoleic acid/(C)) is 0.1 to 1.

(5) The composition according to any one of the clauses (1) to (4), wherein the indigestible dextrin (B) is present in an amount of from 5 to 40% by weight based on a solid content.

(6) The composition according to any one of the clauses (1) to (5), wherein the flavor component (C) is present in an amount of from 1 to 10% by weight based on a solid content.

(7) The composition according to any one of the clauses (1) to (6), wherein the fat or oil (A) that contains linoleic acid as a constituent fatty acid is safflower oil.

(8) The composition according to any one of the clauses (1) to (7), wherein the composition is an oral composition.

(9) The composition according to any one of the clauses (1) to (8), wherein the composition is in the form of granules, fine granules, or powder.

(10) A method for producing the composition according to any one of the clauses (1) to (9), the method including mixing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C).

(11) A method for suppressing an off-flavor of a fat or oil that contains linoleic acid as a constituent fatty acid, the method including mixing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C).

- Advantageous Effects of Invention

[0008]

The present invention provides a composition in which, despite containing a fat or oil that contains linoleic acid as a constituent fatty acid, an off-flavor of the fat or oil generated during storage is suppressed, and also a method for suppressing an off-flavor of a fat or oil that contains linoleic acid as a constituent fatty acid.

DESCRIPTION OF EMBODIMENTS

[0009]

The composition of the present invention contains a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C).

Incorporating a combination of indigestible dextrin (B) and a flavor component (C) into a fat or oil (A) that contains linoleic acid as a constituent fatty acid (hereinafter, also referred to as a fat or oil (A)) can provide a composition in which, despite containing this fat or oil, an off-flavor of the fat or oil generated during storage is suppressed.

[0010]

In the present invention, the fat or oil that contains linoleic acid as a constituent fatty acid refers to a fat or oil that contains a triglyceride containing linoleic acid as a constituent fatty acid.

In the present invention, the fat or oil includes a fat or oil that contains only a triglyceride as well as a fat or oil that contains a triglyceride as a main component and further contains other lipids such as diglycerides, monoglycerides, phospholipids, cholesterol, and free fatty acids. In the present invention, the fat or oil includes a composition containing these lipids.

The fat or oil (A) that contains linoleic acid as a constituent fatty acid may contain one or two or more linoleic acid-containing compounds such as diglycerides, monoglycerides, phospholipids, sterol esters, and alkyl esters of linoleic acid each containing linoleic acid as a constituent fatty acid. The fat or oil (A) may contain free linoleic acid (linoleic acid in the form of free fatty acid).

[0011]

In the present invention, the fat or oil (A) is not limited by its origin, production method, or the like, and is preferably a plant-derived fat or oil (vegetable fat or oil), more preferably a vegetable oil, still more preferably an edible vegetable oil. Examples of the fat or oil (A) that contains linoleic acid as a constituent fatty acid include vegetable oils such as safflower oil, soybean oil, corn oil, palm oil, rapeseed oil, rice bran oil, sesame oil, olive oil (preferably virgin olive oil), and sunflower oil. The fat or oil (A) may be a single fat or oil or may be a combination of two or more fats or oils. In an embodiment, the fat or oil (A) that contains linoleic acid as a constituent fatty acid is preferably at least one selected from the group consisting of safflower oil, soybean oil, and corn oil, more preferably safflower oil. The vegetable oil may be obtained by any extraction method. The present invention can provide a composition in which, despite containing a vegetable oil that contains linoleic acid as a constituent fatty acid, an off-flavor of the vegetable oil generated during storage is suppressed.

[0012]

The amount of the fat or oil (A) that contains linoleic acid as a constituent fatty

acid in the composition of the present invention is preferably 1.5% by weight or more, more preferably 1.6% by weight or more, still more preferably 1.7% by weight or more, particularly preferably 1.8% by weight or more, based on the solid content of the composition, while preferably 5.5% by weight or less, more preferably 5.0% by weight or less, still more preferably 4.9% by weight or less, particularly preferably 2.5% by weight or less. In an embodiment, the amount of the fat or oil (A) in the composition of the present invention is preferably from 1.5 to 5.5% by weight, more preferably from 1.6 to 5.0% by weight, still more preferably from 1.8 to 4.9% by weight, particularly preferably from 1.8 to 2.5% by weight, based on the solid content.

In the present invention, the amount based on the solid content refers to the amount in the composition when the composition is in a solid form (including a granular form, a fine granular form, and a powdery form). When the composition is in a liquid form or a gel form, the components other than water in the composition are regarded as the solid content.

[0013]

The fat or oil (A) that contains linoleic acid as a constituent fatty acid is preferably a fat or oil that contains linoleic acid in an amount from 20 to 70% by weight in terms of free linoleic acid, more preferably a fat or oil that contains linoleic acid in an amount from 25 to 65% by weight in terms of free linoleic acid. Examples of commercially available products of such fats or oils include Safflower Oil Powder 30E (available from Ikeda Tohka Industries Co., Ltd.).

In the composition of the present invention, linoleic acid is present, at least in part, as a constituent fatty acid of a triglyceride, for example, and thus the amount of linoleic acid is expressed in terms of free linoleic acid. In the present invention, the amount of linoleic acid includes linoleic acid contained as a constituent fatty acid in a compound such as a triglyceride. The amount of linoleic acid is the total amount of free linoleic acid and linoleic acid contained as a constituent fatty acid in a compound such as a triglyceride. The amount of linoleic acid in terms of free linoleic acid can be measured by gas chromatography.

[0014]

In the composition of the present invention, the amount of linoleic acid in terms of free linoleic acid is preferably 0.5% by weight or more, more preferably 0.8% by weight or more, still more preferably 1% by weight or more, while preferably 5% by weight or less, more preferably 3% by weight or less, still more preferably 2.5% by weight or less, based on the solid content. In an embodiment, the amount of linoleic

acid in terms of free linoleic acid in the composition of the present invention is preferably from 0.5 to 5% by weight, more preferably from 0.8 to 3% by weight, still more preferably from 1 to 2.5% by weight, based on the solid content. When the amount of linoleic acid in terms of free linoleic acid based on the solid content falls within the above ranges, an off-flavor of a fat or oil generated during storage can be further suppressed.

[0015]

The composition of the present invention contains indigestible dextrin (B). Indigestible dextrin is a type of dextrin and is an indigestible starch degradation product that is not readily digested by human digestive enzymes. Indigestible dextrin is obtainable, for example, by hydrolyzing roasted dextrin with α-amylase and glucoamylase. Indigestible dextrin is commercially available in forms such as powder, fine granules, and granules, and such commercially available products can be used. In addition, indigestible dextrin is water-soluble and thus may be used in the form of an aqueous solution. Examples of commercially available products of indigestible dextrin include Sandec #150 (registered trademark, Sanwa Starch Co., Ltd.), Fibersol-2 (trade name, Matsutani Chemical Industry Co., Ltd.), and indigestible dextrin under the GronG brand (Ultimate Life). The indigestible dextrin as used herein also includes hydrogenated reduced indigestible dextrin.

[0016]

The amount of the indigestible dextrin (B) in the composition of the present invention is preferably 5% by weight or more, more preferably 8% by weight or more, still more preferably 10% by weight or more, while preferably 40% by weight or less, more preferably 36% by weight or less, still more preferably 30% by weight or less, based on the solid content. In an embodiment, the amount of the indigestible dextrin (B) in the composition of the present invention is preferably from 5 to 40% by weight, more preferably from 8 to 36% by weight, still more preferably from 10 to 30% by weight, based on the solid content. When the amount of the indigestible dextrin in the composition falls within the above ranges, an off-flavor of a fat or oil generated during storage can be further suppressed.

[0017]

The amount of the indigestible dextrin can be measured by any method, such as HPLC. For example, the amount of polysaccharides can be measured by high-performance liquid chromatography (enzyme HPLC assay), which is an analytical method for dietary fiber described in Eishin No. 13 (“Eiyo Hyoji Kijun ni okeru Eiyo

Seibun To no Bunseki Hoho To ni tsuite (Analytical Methods for Nutrients on Nutrition Labeling Standards))".

[0018]

In the composition of the present invention, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)) is preferably 0.01 or more, more preferably 0.045 or more, still more preferably 0.065 or more, particularly preferably 0.067 or more, while preferably 0.5 or less, more preferably 0.2 or less, still more preferably 0.15 or less, particularly preferably 0.1 or less. In an embodiment, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)) is preferably from 0.01 to 0.5, more preferably from 0.045 to 0.2, still more preferably from 0.065 to 0.15, particularly preferably from 0.067 to 0.1. When the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)) falls within the above ranges, the composition can give an enhanced flavor while an off-flavor of a fat or oil due to oxidative deterioration of linoleic acid is suppressed. In addition, an off-flavor of a fat or oil is less likely to remain in the mouth after the composition is ingested.

[0019]

The flavor component (C) in the composition of the present invention is a component that imparts aroma and taste to the composition. The flavor component is preferably one that can be used in food or beverage products. In an embodiment, the flavor component (C) is preferably a plant-derived flavor component. This is because use of a plant-derived flavor component can further suppress an off-flavor of a fat or oil generated during storage. The composition of the present invention may contain one flavor component or may contain two or more flavor components. The flavor component in the present invention does not include dairy products or sweeteners described below. In the present invention, the flavor component (C) is preferably at least one selected from the group consisting of a coffee extract, matcha, and cocoa powder. To more effectively suppress an off-flavor of a fat or oil, a coffee extract is more preferred.

[0020]

Examples of the coffee extract include an extract obtained from roasted coffee beans or crushed products thereof by extraction with water (including warm water), a concentrate of the extract, and a dried product obtained by drying the extract or the concentrate. The coffee extract may be in a liquid form, a solid form such as powder, a

slurry form, or a gel form. Preferably, the coffee extract is in a solid form such as powder. Preferably, the coffee extract is a dried product of an extract obtained from roasted coffee beans or crushed products thereof by extraction with water, or of a concentrate thereof. The coffee extract typically contains flavor components such as 2-furfurylthiol (a component exhibiting a roasted aroma), vanillin (a component exhibiting a vanilla aroma), and guaiacol (a component exhibiting a spicy aroma). The coffee extract also contains taste components such as caffeine, chlorogenic acid, and caffeic acid.

[0021]

The coffee extract may be a commercially available product (e.g., commercially available instant coffee). Examples of such commercially available products include instant coffee available from Nestlé S.A. (Nescafé) and instant coffee available from UCC Ueshima Coffee Co., Ltd.

The coffee extract is preferably a coffee extract obtained from roasted coffee beans having an L value of from 16 to 26; the L value of the roasted coffee beans is more preferably from 17 to 23, still more preferably from 17 to 21. The L value represents lightness and serves as an index of the roasting degree of roasted coffee beans. The L value can be measured using a color difference meter. The coffee extract is more preferably a powder obtained by drying an extract obtained from roasted coffee beans having an L value of 19 ± 1 by extraction with water.

[0022]

Matcha is obtained by pulverizing tencha. Tencha is produced by steaming leaves of tea plants belonging to the genus *Camellia* of the family *Theaceae*, followed by drying. In the present invention, matcha may be one produced by a method known in the art. Matcha contains flavor components such as dimethyl sulfide (a component exhibiting a green laver-like aroma), 2-methylpropanal (a component exhibiting a malt-like aroma), and 3-methylbutanal (a component exhibiting a cocoa-like aroma). Matcha also contains taste components such as catechin and caffeine. Commercially available matcha may be used. For example, matcha is commercially available from Ito En, Ltd. and Aiya Co., Ltd. (Saijoen brand).

[0023]

Cocoa powder is obtained by removing cocoa butter from cocoa mass and pulverizing the remainder. The cocoa powder may contain cocoa butter. Cocoa powder contains flavor components such as 2-ethyl-3,6-dimethylpyrazine (a component exhibiting a roasted aroma), γ-nonalactone (a component exhibiting a sweet aroma), and

4-vinylguaiacol (a component exhibiting a smoky aroma). Cocoa powder also contains taste components such as polyphenols. Commercially available cocoa powder may be used. Examples of commercially available products include cocoa powder available from Takahashi Co., Ltd.

[0024]

The amount of the flavor component (C) in the composition of the present invention can be set as appropriate in accordance with the type of the flavor component. The amount of the flavor component (C) in the composition of the present invention is preferably 1% by weight or more, more preferably 2% by weight or more, still more preferably 2.5% by weight or more, while preferably 10% by weight or less, more preferably 9.5% by weight or less, still more preferably 8.6% by weight or less, based on the solid content. In an embodiment, the amount of the flavor component (C) in the composition of the present invention is preferably from 1 to 10% by weight, more preferably from 2 to 9.5% by weight, still more preferably from 2.5 to 8.6% by weight, based on the solid content. When the composition contains two or more flavor components (C), the above amount refers to the total amount of these.

[0025]

When the composition of the present invention contains a coffee extract, the amount thereof is preferably such that the amount of the solid content of the coffee extract is from 1 to 10% by weight, more preferably from 2 to 8% by weight, still more preferably from 2.5 to 3.5% by weight, based on the solid content of the composition. In the present invention, the amount of the coffee extract is expressed as an amount of the solid content of the coffee extract. The solid content of the coffee extract means soluble solids contained in the coffee extract, a concentrate thereof, or a dried product thereof. The soluble solids are soluble solids extracted from coffee beans.

[0026]

When the composition of the present invention contains matcha, the amount thereof is preferably from 1 to 10% by weight, more preferably from 2 to 8% by weight, still more preferably from 3 to 5% by weight, based on the solid content of the composition.

[0027]

When the composition of the present invention contains cocoa powder, the amount thereof is preferably from 1 to 10% by weight, more preferably from 5 to 9.5% by weight, still more preferably from 8 to 9% by weight, based on the solid content of the composition.

In the present invention, preferably, the amount of the flavor component (C) based on the solid content of the composition falls within the above ranges.

[0028]

In the composition of the present invention, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the flavor component (C) (linoleic acid/(C)) is preferably 0.1 or more, more preferably 0.2 or more, still more preferably 0.3 or more, even more preferably 0.4 or more, particularly preferably 0.5 or more, while preferably 1 or less, more preferably 0.9 or less, still more preferably 0.8 or less. In an embodiment, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the flavor component (C) (linoleic acid/(C)) is preferably from 0.1 to 1, more preferably from 0.2 to 1, still more preferably from 0.3 to 0.9, even more preferably from 0.4 to 0.9, particularly preferably from 0.5 to 0.8. When the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the flavor component (C) (linoleic acid/(C)) falls within the above ranges, an off-flavor of a fat or oil is less likely to remain in the mouth after the composition is ingested. In addition, the flavor derived from the flavor component (C) is well perceived. Thus, the composition can give an enhanced flavor while an off-flavor of a fat or oil due to oxidative deterioration of linoleic acid is suppressed.

[0029]

In an embodiment of the present invention, where the composition contains matcha, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of matcha in the composition (linoleic acid/matcha) is preferably from 0.1 to 1, more preferably from 0.2 to 0.9, still more preferably from 0.3 to 0.8.

[0030]

In an embodiment of the present invention, where the composition contains a coffee extract, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of coffee extract (solid content) in the composition (linoleic acid/coffee extract) is preferably from 0.2 to 1, more preferably from 0.3 to 0.9, still more preferably from 0.4 to 0.8.

[0031]

In an embodiment of the present invention, where the composition contains cocoa powder, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of cocoa powder in the composition (linoleic acid/cocoa powder) is preferably from 0.1 to 1, more preferably from 0.1 to 0.9, still more preferably from 0.1 to 0.8.

[0032]

The composition of the present invention may contain components other than the above components (A), (B), and (C) (hereinafter referred to as different components) as long as the effect of the present invention is not impaired.

Examples of the different components include amino acids, proteins, dairy products, sweeteners, vitamins, minerals, peptides (e.g., L-carnosine), and additives. One different component may be used, or two or more different components may be used. The different components do not include the above components (A), (B), and (C).

[0033]

Examples of dairy products include skim milk powder, whole milk powder, whey powder, fresh cream, and powder milk cream. One dairy product may be used, or two or more dairy products may be used. In an embodiment, the composition of the present invention preferably contains a dairy product, and more preferably contains one or two or more selected from skim milk powder, whole milk powder, and powder milk cream. The presence of a dairy product in the composition further enhances the flavor of the composition. The amount of the dairy product in the composition of the present invention is preferably, for example, from 10 to 50% by weight, more preferably from 25 to 45% by weight, still more preferably from 30 to 43% by weight, based on the solid content. A commercially available dairy product can be used. For example, skim milk powder is commercially available from Yotsuba Milk Products Co., Ltd. and Morinaga Milk Industry Co., Ltd. Examples of commercially available powder milk cream include Creap (trade name) available from Morinaga Milk Industry Co., Ltd.

[0034]

The sweetener is preferably a non-sugar sweetener, and examples thereof include sucralose, acesulfame potassium, monk fruit extract, and stevia extract. One sweetener may be used, or two or more sweeteners may be used. The sweetener is preferably at least one selected from the group consisting of sucralose and acesulfame potassium. In an embodiment, the composition of the present invention preferably contains a sweetener. The presence of a sweetener in the composition further enhances the flavor of the composition. The sweetener may be a commercially available product.

When the sweetener is at least one selected from the group consisting of sucralose and acesulfame potassium, for example, the amount of the sweetener in the composition of the present invention is preferably from 0.001 to 0.1% by weight, more preferably from 0.02 to 0.08% by weight, based on the solid content.

[0035]

Examples of the vitamins include vitamin A, vitamin E, vitamin C, vitamin B1, vitamin B2, niacin, vitamin B6, vitamin B12, folic acid, biotin, and pantothenic acid. For the amounts of vitamins per 1000 kcal of the composition of the present invention, particularly preferably, the amount of vitamin A is 5000 IU or more, the amount of vitamin E is 30 IU or more, the amount of vitamin C is 60 mg or more, the amount of vitamin B1 is 1.5 mg or more, the amount of vitamin B2 is 1.7 mg or more, niacin is 20 mg or more, vitamin B6 is 2.0 mg or more, the amount of vitamin B12 is 6 μg or more, the amount of folic acid is 0.4 mg or more, the amount of biotin is 0.3 μg or more, and the amount of pantothenic acid is 10 mg or more. The composition of the present invention preferably contains the above amounts of vitamins per 1000 kcal of the composition. Examples of the minerals include calcium, phosphorus, iron, iodine, magnesium, copper, zinc, potassium, manganese, and sodium. For the amounts of minerals per 1000 kcal of the composition of the present invention, particularly preferably, the amount of calcium is 1 g or more, the amount of phosphorus is 1 g or more, the amount of iron is 18 mg or more, the amount of iodine is 150 μg or more, the amount of magnesium is 400 mg or more, the amount of copper is 2 mg or more, the amount of zinc is 15 mg or more, the amount of potassium is 1.2 mg or more, the amount of manganese is 2 mg or more, and the amount of sodium is 1 g or more. The composition of the present invention preferably contains the above amounts of minerals per 1000 kcal of the composition. Examples of raw materials containing minerals include organic acid salts (e.g., gluconates, citrates, tartrates, and malates), inorganic salts (e.g., chlorides, hydroxides, sulfates, nitrates, and phosphates), carbonates, mineral yeasts, eggshell calcium, shell calcium, coral calcium, whey minerals, and dolomite. One vitamin may be used or two or more vitamins may be used, and one mineral may be used or two or more minerals may be used. In the case of incorporating vitamins and/or minerals into the composition of the present invention, the total amount thereof is preferably from 0.5 to 1.5% by weight based on the solid content of the composition.

The composition of the present invention may further contain, for example, soybean-derived protein.

[0036]

The additives are preferably additives usable in foods and beverages, oral pharmaceutical products, or oral quasi-pharmaceutical products. Examples of the additives include excipients (e.g., dextrin (other than indigestible dextrin)), binders, antioxidants, emulsifiers, and colorants.

[0037]

The composition of the present invention is preferably an oral composition. An oral composition refers to a composition that is orally ingestible. Examples of the oral composition include foods and beverages, oral pharmaceutical products, and oral quasi-pharmaceutical products, with foods and beverages being preferred. The foods and beverages include general foods and beverages, meal replacement products (MRPs), health foods, health beverages, foods with function claims, foods for specified health uses, dietary supplements, and foods and beverages for the sick.

When the composition of the present invention is an oral composition, the calorie content per single intake of the composition is preferably 400 kcal or less, more preferably from 200 to 400 kcal. In an embodiment, the composition of the present invention can be favorably used as a meal replacement product (MRP). When the composition of the present invention is a meal replacement product (MRP), the calorie content per single intake of the composition is preferably 400 kcal or less, more preferably from 200 to 400 kcal.

[0038]

In an embodiment, the composition of the present invention preferably contains any of a dairy product, a sweetener, a vitamin, and a mineral in addition to the above components (A), (B), and (C). In an embodiment, the composition of the present invention preferably contains any of vitamin A, vitamin E, vitamin C, vitamin B1, vitamin B2, niacin, vitamin B6, vitamin B12, folic acid, biotin, pantothenic acid, calcium, phosphorus, iron, iodine, magnesium, copper, zinc, potassium, manganese, sodium, skim milk powder, powder milk cream, and a sweetener. The composition of the present invention may be a meal replacement product (MRP) containing vitamins and minerals described above. The composition of the present invention may further contain linoleic acid (free linoleic acid) in addition to the above component (A). In the present invention, the amount of linoleic acid in the composition in terms of free linoleic acid includes free linoleic acid derived from raw materials other than the fat or oil (A). The present invention enables provision of a composition containing a fat or oil (A), a vitamin, a mineral, a dairy product, and a sweetener, in which an off-flavor of a fat or oil is suppressed.

[0039]

In an embodiment, where the composition of the present invention is an oral composition, the amount of linoleic acid in the composition in terms of free linoleic acid per adult daily intake is preferably from 650 to 1900 mg, more preferably from 670 to 1800 mg, still more preferably from 670 to 1340 mg, particularly preferably from 900 to

1340 mg.

[0040]

The composition of the present invention may be in any form such as a solid form (including granules, fine granules, and powder) or a liquid form, and is preferably in a solid form, more preferably in the form of granules, fine granules, or powder.

In an embodiment, the composition of the present invention can be suitably used as a solid beverage (solid beverage composition). A solid beverage is a solid composition that is mixed with a potable solvent such as water or milk to prepare a beverage. The solid beverage may be in any form such as granules, fine granules, or powder.

[0041]

The composition of the present invention can be produced by mixing the above fat or oil (A), indigestible dextrin (B), and flavor component (C), and optionally other raw materials.

A method for producing a composition, the method including mixing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C) is also an aspect of the present invention.

This production method can produce the composition of the present invention described above.

The present invention also encompasses a method for suppressing an off-flavor of a fat or oil that contains linoleic acid as a constituent fatty acid, the method including mixing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C). Mixing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C) can provide a composition in which an off-flavor of the fat or oil that contains linoleic acid as a constituent fatty acid is suppressed.

[0042]

In the production method and the method for suppressing an off-flavor of a fat or oil of the present invention, the fat or oil (A) that contains linoleic acid as a constituent fatty acid, the indigestible dextrin (B), and the flavor component (C), as well as preferred embodiments thereof are the same as those of the composition of the present invention described above. The weight ratio of linoleic acid in terms of free linoleic acid to the indigestible dextrin (B) (linoleic acid/(B)) is preferably from 0.01 to 0.5, more preferably from 0.045 to 0.2, still more preferably from 0.065 to 0.15, particularly preferably from 0.067 to 0.1. The weight ratio of linoleic acid in terms of

free linoleic acid to the flavor component (C) (linoleic acid/(C)) is preferably from 0.1 to 1, more preferably from 0.2 to 1, still more preferably from 0.3 to 0.9, even more preferably from 0.4 to 0.9, particularly preferably from 0.5 to 0.8.

In the present invention, the fat or oil (A), the indigestible dextrin (B), and the flavor component (C) are preferably mixed such that the amounts thereof in the resulting composition fall within the ranges described above. In the production method and the method for suppressing an off-flavor of a fat or oil of the present invention, preferred ranges of the amounts of the respective components, such as the amount of linoleic acid in terms of free linoleic acid in the resulting composition, are the same as those of the composition of the present invention described above.

[0043]

In an embodiment of the present invention, where the flavor component (C) is matcha, the weight ratio of linoleic acid in terms of free linoleic acid to matcha (linoleic acid/matcha) is preferably from 0.1 to 1, more preferably from 0.2 to 0.9, still more preferably from 0.3 to 0.8. In an embodiment of the present invention, where the flavor component (C) is a coffee extract, the weight ratio of linoleic acid in terms of free linoleic acid to the coffee extract (solid content) (linoleic acid/coffee extract) is preferably from 0.2 to 1, more preferably from 0.3 to 0.9, still more preferably from 0.4 to 0.8. In an embodiment of the present invention, where the flavor component (C) is cocoa powder, the weight ratio of linoleic acid in terms of free linoleic acid to cocoa powder (linoleic acid/cocoa powder) is preferably from 0.1 to 1, more preferably from 0.1 to 0.9, still more preferably from 0.1 to 0.8.

[0044]

The components may be mixed in any order; all raw materials may be mixed simultaneously, or they may be mixed sequentially. For example, when all raw materials are in the form of powder, a powder composition can be produced by directly mixing all raw materials.

[0045]

When powder raw materials and liquid raw materials are used, for example, a granular, fine granular, or powder composition can be produced by first mixing the powder raw materials, then mixing the resulting powder mixture with the liquid raw materials or spraying the liquid raw materials onto the powder mixture, and drying the mixture. Alternatively, a liquid composition can be produced by dissolving or dispersing the powder raw materials in the liquid raw materials.

[0046]

Each numerical range defined by the lower limit and the upper limit herein, i.e., “the lower limit to the upper limit”, includes the lower limit and the upper limit. For example, the range defined by “1 to 2” means 1 or more and 2 or less, with 1 and 2 being included. The upper limits and the lower limits herein may be used in any combination to form a range.

The academic literature and patent literature mentioned herein are all incorporated herein by reference.

EXAMPLES

[0047]

The present invention is described in further detail below with reference to examples, but is not limited to these examples.

[0048]

The raw materials used in the examples are as follows.

Safflower oil-containing powder: powder containing approximately 50% by weight of safflower oil (containing approximately 30% by weight of linoleic acid in terms of free linoleic acid, available from Ikeda Tohka Industries Co., Ltd.)

(B) Indigestible dextrin: powdered indigestible dextrin

(C1) Matcha powder: matcha

(C2) Coffee powder: instant coffee

(C3) Cocoa powder: pure cocoa powder

Skim milk powder: skim milk powder

Cream powder: powder milk cream produced from milk

Sweetener A: acesulfame potassium

Sweetener B: sucralose

Dextrin: maltodextrin (powder)

Commercially available products were used as the above raw materials.

[0049]

<Example 1>

The raw materials shown in Table 1 were accurately weighed and mixed, and the mixture was then sieved through a 20-mesh screen to obtain homogeneous compositions (powder compositions) of Level 1-1 to Level 1-4. The safflower oil-containing powder used in Examples 1 to 3 contained 30% by weight of linoleic acid in terms of free linoleic acid. The safflower oil-containing powder contained 48% by weight of safflower oil.

The amount of linoleic acid in terms of free linoleic acid in the compositions of Level 1-1 to Level 1-4 was 1.17% by weight (671 mg). Table 1 also shows the amounts (weight%) of the respective components in the compositions, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)), and the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the matcha powder (C1) (linoleic acid/(C1)). The amount of safflower oil in the compositions of Level 1-1 to Level 1-4 was 1.87% by weight.

[0050]

[Table 1]

		Level 1-1	Level 1-2	Level 1-3	Level 1-4
Amount (g)	Safflower oil-containing powder	2.235	2.235	2.235	2.235
	(B) Indigestible dextrin	10.0	0	0	10.0
	(C1) Matcha powder	0	1.9	0	1.9
	Skim milk powder	16.5	16.5	16.5	16.5
	Powder milk cream	8.0	8.0	8.0	8.0
	Sweetener A	0.02835	0.02835	0.02835	0.02835
	Sweetener B	0.01053	0.01053	0.01053	0.01053
	Dextrin	20.73	28.83	30.73	18.83
	Total	57.50388	57.50388	57.50388	57.50388
Weight%	Safflower oil-containing powder	3.89	3.89	3.89	3.89
	(B) Indigestible dextrin	17.39	0.00	0.00	17.39
	(C1) Matcha powder	0.00	3.30	0.00	3.30
	Skim milk powder	28.69	28.69	28.69	28.69
	Powder milk cream	13.91	13.91	13.91	13.91
	Sweetener A	0.05	0.05	0.05	0.05
	Sweetener B	0.02	0.02	0.02	0.02
	Dextrin	36.05	50.14	53.44	32.75
	Total	100.00	100.00	100.00	100.00
Weight ratio	Linoleic acid/(B)	0.067	—	—	0.067
	Linoleic acid/(C1)	—	0.353	—	0.353

[0051]

<Example 2>

Except that the amounts of the respective raw materials were set as shown in Table 2, compositions of Level 2-1 to Level 2-4 were prepared in the same manner as in Example 1. The amount of linoleic acid in terms of free linoleic acid in the

compositions of Level 2-1 to Level 2-4 was 1.18% by weight (671 mg). Table 2 also shows the amounts (weight%) of the respective components in the compositions of Level 2-1 to Level 2-4, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)), and the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the coffee powder (C2) (linoleic acid/(C2)). The amount of safflower oil in the compositions of Level 2-1 to Level 2-4 was 1.88% by weight.

[0052]

[Table 2]

		Level 2-1	Level 2-2	Level 2-3	Level 2-4
Amount (g)	Safflower oil-containing powder	2.235	2.235	2.235	2.235
	(B) Indigestible dextrin	10.0	0	0	10.0
	(C2) Coffee powder	0	1.5	0	1.5
	Skim milk powder	16.5	16.5	16.5	16.5
	Powder milk cream	8.0	8.0	8.0	8.0
	Sweetener A	0.02880	0.02880	0.02880	0.02880
	Sweetener B	0.01080	0.01080	0.01080	0.01080
	Dextrin	20.23	28.73	30.23	18.73
	Total	57.0046	57.0046	57.0046	57.0046
Weight%	Safflower oil-containing powder	3.92	3.92	3.92	3.92
	(B) Indigestible dextrin	17.54	0.00	0.00	17.54
	(C2) Coffee powder	0.00	2.63	0.00	2.63
	Skim milk powder	28.95	28.95	28.95	28.95
	Powder milk cream	14.03	14.03	14.03	14.03
	Sweetener A	0.05	0.05	0.05	0.05
	Sweetener B	0.02	0.02	0.02	0.02
	Dextrin	35.49	50.40	53.03	32.86
	Total	100.00	100.00	100.00	100.00
Weight ratio	Linoleic acid/(B)	0.067	—	—	0.067
	Linoleic acid/(C2)	—	0.447	—	0.447

[0053]

<Example 3>

Except that the amounts of the respective raw materials were set as shown in Table 3, compositions of Level 3-1 to Level 3-4 were prepared in the same manner as in Example 1. The amount of linoleic acid in terms of free linoleic acid in the compositions of Level 3-1 to Level 3-4 was 1.15% by weight (671 mg). Table 3 also

shows the amounts (weight%) of the respective components in the compositions of Level 3-1 to Level 3-4, the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)), and the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the cocoa powder (C3) (linoleic acid/(C3)). The amount of safflower oil in the compositions of Level 3-1 to Level 3-4 was 1.83% by weight.

[0054]

[Table 3]

		Level 3-1	Level 3-2	Level 3-3	Level 3-4
Amount (g)	Safflower oil-containing powder	2.235	2.235	2.235	2.235
	(B) Indigestible dextrin	10.0	0	0	10.0
	(C3) Cocoa powder	0	5.0	0	5.0
	Skim milk powder	15.0	15.0	15.0	15.0
	Powder milk cream	8.0	8.0	8.0	8.0
	Sweetener A	0.02880	0.02880	0.02880	0.02880
	Sweetener B	0.01080	0.01080	0.01080	0.01080
	Dextrin	23.23	28.23	33.23	18.23
	Total	58.5046	58.5046	58.5046	58.5046
Weight%	Safflower oil-containing powder	3.82	3.82	3.82	3.82
	(B) Indigestible dextrin	17.09	0.00	0.00	17.09
	(C3) Cocoa powder	0.00	8.55	0.00	8.55
	Skim milk powder	25.64	25.64	25.64	25.64
	Powder milk cream	13.67	13.67	13.67	13.67
	Sweetener A	0.05	0.05	0.05	0.05
	Sweetener B	0.02	0.02	0.02	0.02
	Dextrin	39.71	48.25	56.80	31.16
	Total	100.00	100.00	100.00	100.00
Weight ratio	Linoleic acid/(B)	0.067	—	—	0.067
	Linoleic acid/(C3)	—	0.134	—	0.134

[0055]

<Evaluation of oily odor>

The compositions obtained in Examples 1 to 3 were placed and sealed in aluminum pouches, and subjected to accelerated deterioration under constant temperature conditions at 55°C and 75% RH for 3 days. Each composition (the entire amount) subjected to accelerated deterioration was mixed with 200 mL of water, followed by shaking with a shaker to prepare a food or beverage in which the

composition was dispersed in water.

The prepared food or beverage was evaluated for the intensity of oily odor (off-flavor of fats or oils) of the composition by four well-trained sensory panelists. In the evaluation, the panelists first poured into a plastic cup and smelled each prepared food or beverage, then swallowed approximately 50 mL of the food or beverage, and with reference to the evaluation criteria, evaluated the perceived level of oily odor according to the following evaluation criteria (1 to 4 points) with 0.5-point increments (7 levels). Subsequently, the average of the scores given by the four panelists was calculated.

(Evaluation criteria for oily odor level)

1: not suppressed at all

2: slightly suppressed

3: suppressed

4: considerably suppressed

[0056]

Table 4 shows the results of evaluating the compositions obtained in Example 1. Table 5 shows the results of evaluating the compositions obtained in Example 2. Table 6 shows the results of evaluating the compositions obtained in Example 3. The results are expressed by the average scores.

[0057]

[Table 4]

	Level 1-1	Level 1-2	Level 1-3	Level 1-4
Oily odor level (score)	1.9	3.3	1.3	3.8

[0058]

[Table 5]

	Level 2-1	Level 2-2	Level 2-3	Level 2-4
Oily odor level (score)	2.0	3.5	1.3	3.9

[0059]

[Table 6]

	Level 3-1	Level 3-2	Level 3-3	Level 3-4
Oily odor level (score)	2.0	3.3	1.3	4.0

[0060]

In the compositions containing a flavor component (matcha, coffee extract, or

cocoa powder) in addition to the fat or oil that contains linoleic acid as a constituent fatty acid, oily odor (off-flavor of fats or oils) was significantly suppressed as compared with the compositions containing no flavor component. In the compositions containing a combination of a flavor component and indigestible dextrin, oily odor was further suppressed.

[0061]

<Example 4>

A matcha-flavored composition was prepared using matcha powder as the flavor component. Except that the amounts of the respective raw materials were set as shown in Table 7, compositions (Level 4-1 to Level 4-3) were prepared in the same manner as in Example 1.

Table 7 also shows the amounts (weight%) of the respective components in the compositions of Level 4-1 to Level 4-3. The safflower oil-containing powder used in Examples 4 to 6 contained 31.8% by weight of linoleic acid in terms of free linoleic acid. The safflower oil-containing powder contained 48% by weight of safflower oil. The amount of linoleic acid in terms of free linoleic acid in the compositions of Level 4-1 and Level 4-2 was 1.17% by weight (670 mg). The amount of linoleic acid in terms of free linoleic acid in the composition of Level 4-3 was 1.56% by weight (894 mg). Table 7 also shows the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)), and the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the matcha powder (C1) (linoleic acid/(C1)). The amount of safflower oil in the compositions of Level 4-1 and Level 4-2 was 1.76% by weight, and the amount of safflower oil in the composition of Level 4-3 was 2.35% by weight.

[0062]

[Table 7]

		Level 4-1	Level 4-2	Level 4-3
Amount (g)	Safflower oil-containing powder	2.107	2.107	2.81
	(B) Indigestible dextrin	0	10.0	20.0
	(C1) Matcha powder	1.9	1.9	1.9
	Skim milk powder	16.5	16.5	16.5
	Powder milk cream	8.0	8.0	8.0
	Sweetener A	0.02835	0.02835	0.02835
	Sweetener B	0.01053	0.01053	0.01053
	Dextrin	28.83	18.83	8.25
	Total	57.37588	57.37588	57.49888
Weight%	Safflower oil-containing powder	3.67	3.67	4.89
	(B) Indigestible dextrin	0.00	17.43	34.78
	(C1) Matcha powder	3.31	3.31	3.30
	Skim milk powder	28.76	28.76	28.70
	Powder milk cream	13.94	13.94	13.91
	Sweetener A	0.05	0.05	0.05
	Sweetener B	0.02	0.02	0.02
	Dextrin	50.25	32.82	14.35
	Total	100.00	100.00	100.00
Weight ratio	Linoleic acid/(B)	—	0.067	0.045
	Linoleic acid/(C1)	0.353	0.353	0.471

[0063]

<Example 5>

A coffee-flavored composition was prepared using coffee powder as the flavor component. Except that the amounts of the respective raw materials were set as shown in Table 8, compositions of Level 5-1 to Level 5-5 were prepared in the same manner as in Example 1.

Table 8 also shows the amounts (weight%) of the respective components in the compositions of Level 5-1 to Level 5-5. The amount of linoleic acid in terms of free linoleic acid in the compositions of Level 5-1 to Level 5-3 was 1.18% by weight (670 mg). The amount of linoleic acid in terms of free linoleic acid in the compositions of Level 5-4 and Level 5-5 was 1.57% by weight (894 mg). Table 8 also shows the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the

indigestible dextrin (B) (linoleic acid/(B)), and the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the coffee powder (C2) (linoleic acid/(C2)). The amount of safflower oil in the compositions of Level 5-1 to Level 5-3 was 1.78% by weight, and the amount of safflower oil in the compositions of Level 5-4 and Level 5-5 was 2.37% by weight.

[0064]

[Table 8]

		Level 5-1	Level 5-2	Level 5-3	Level 5-4	Level 5-5
Amount (g)	Safflower oil-containing powder	2.107	2.107	2.107	2.81	2.81
	(B) Indigestible dextrin	0	5.0	10.0	10.0	20.0
	(C2) Coffee powder	1.5	1.5	1.5	1.5	1.5
	Skim milk powder	16.5	16.5	16.5	16.5	16.5
	Powder milk cream	8.0	8.0	8.0	8.0	8.0
	Sweetener A	0.02880	0.02880	0.02880	0.02880	0.02880
	Sweetener B	0.01080	0.01080	0.01080	0.01080	0.01080
	Dextrin	28.73	23.73	18.73	18.15	8.15
	Total	56.8766	56.8766	56.8766	56.9996	56.9996
Weight%	Safflower oil-containing powder	3.70	3.70	3.70	4.93	4.93
	(B) Indigestible dextrin	0.00	8.79	17.58	17.54	35.09
	(C2) Coffee powder	2.64	2.64	2.64	2.63	2.63
	Skim milk powder	29.01	29.01	29.01	28.95	28.94
	Powder milk cream	14.07	14.07	14.07	14.04	14.03
	Sweetener A	0.05	0.05	0.05	0.05	0.05
	Sweetener B	0.02	0.02	0.02	0.02	0.02
	Dextrin	50.51	41.72	32.93	31.84	14.30
	Total	100.00	100.00	100.00	100.00	100.00
Weight ratio	Linoleic acid/(B)	—	0.134	0.067	0.089	0.045
	Linoleic acid/(C2)	0.447	0.447	0.447	0.596	0.596

[0065]

<Example 6>

A cocoa-flavored composition was produced using cocoa powder as the flavor component. Except that the amounts of the respective raw materials were set as shown in Table 9, compositions of Level 6-1 to Level 6-3 were prepared in the same manner as in Example 1.

Table 9 also shows the amounts (weight%) of the respective components in the compositions of Level 6-1 to Level 6-3. The amount of linoleic acid in terms of free linoleic acid in the compositions of Level 6-1 and Level 6-2 was 1.15% by weight (670 mg). The amount of linoleic acid in terms of free linoleic acid in the composition of

Level 6-3 was 1.55% by weight (894 mg). Table 9 also shows the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)), and the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the cocoa powder (C3) (linoleic acid/(C3)). The amount of safflower oil in the compositions of Level 6-1 and Level 6-2 was 1.73% by weight, and the amount of safflower oil in the composition of Level 6-3 was 2.31% by weight.

[0066]

[Table 9]

		Level 6-1	Level 6-2	Level 6-3
Amount (g)	Safflower oil-containing powder	2.107	2.107	2.81
	(B) Indigestible dextrin	0	10.0	20.0
	(C3) Cocoa powder	5.0	5.0	5.0
	Skim milk powder	15.0	15.0	15.0
	Powder milk cream	8.0	8.0	8.0
	Sweetener A	0.02880	0.02880	0.02880
	Sweetener B	0.01080	0.01080	0.01080
	Dextrin	28.23	18.23	7.65
	Total	58.3766	58.3766	58.4996
Weight%	Safflower oil-containing powder	3.61	3.61	4.80
	(B) Indigestible dextrin	0.00	17.13	34.19
	(C3) Cocoa powder	8.57	8.57	8.55
	Skim milk powder	25.70	25.70	25.64
	Powder milk cream	13.70	13.70	13.68
	Sweetener A	0.05	0.05	0.05
	Sweetener B	0.02	0.02	0.02
	Dextrin	48.36	31.23	13.08
	Total	100.00	100.00	100.00
Weight ratio	Linoleic acid/(B)	—	0.067	0.045
	Linoleic acid/(C3)	0.134	0.134	0.179

[0067]

<Evaluation of persistence of aftertaste/lingering of flavor>

The compositions obtained in Examples 4 to 6 were placed and sealed in

aluminum pouches, and subjected to accelerated deterioration under constant temperature conditions at 55°C and 75% RH for 3 days. Each composition (the entire amount) subjected to accelerated deterioration was mixed with 200 mL of water, followed by shaking with a shaker to prepare a matcha-flavored food or beverage, cocoa-flavored food or beverage, or coffee-flavored food or beverage in which the composition was dispersed in water.

The prepared food or beverage was subjected to sensory evaluation for persistence of oily odor flavor (off-flavor of fats or oils) and lingering of flavor of the flavor component (flavor of the flavor component perceived in the aftertaste) by four well-trained sensory panelists.

In the sensory evaluation, the panelists swallowed approximately 50 mL of each food or beverage, and then evaluated the persistence of oily odor and lingering of flavor of the flavor component (matcha powder, coffee powder, or cocoa powder) remaining in the mouth according to the following evaluation criteria from 1 to 4 points with 0.5-point increments (7 levels). Subsequently, the average of the scores given by the four panelists was calculated.

(Evaluation criteria for persistence of aftertaste/lingering of flavor)

1: oily odor remains in the mouth continuously and palatability is absent

2: oily odor slightly remains in the mouth and interferes with the flavor of the flavor component

3: oily odor does not remain in the mouth so much and the taste of the flavor component can be enjoyed

4: oily odor does not remain in the mouth so much and lingering of flavor of the flavor component slightly remains in the mouth

[0068]

Table 10 shows the results of evaluating the compositions obtained in Example 4. Table 11 shows the results of evaluating the compositions obtained in Example 5. Table 12 shows the results of evaluating the compositions obtained in Example 6. The results are expressed by the average scores. The presence of a flavor component (matcha, coffee extract, or cocoa powder) and indigestible dextrin in addition to the fat or oil that contains linoleic acid as a constituent fatty acid significantly suppressed oily odor (off-flavor of fats or oils) as compared with the compositions not containing these components. Further, when the weight ratio of the amount of linoleic acid in terms of free linoleic acid to the amount of the indigestible dextrin (B) (linoleic acid/(B)) was 0.01 to 0.5, oily odor was suppressed, lingering of flavor of the flavor component was

perceived, and the flavor of the composition was more favorably perceived.

[0069]

[Table 10]

	Level 4-1	Level 4-2	Level 4-3
Persistence of aftertaste/lingering of flavor (score)	2.0	3.5	3.5

[0070]

[Table 11]

	Level 5-1	Level 5-2	Level 5-3	Level 5-4	Level 5-5
Persistence of aftertaste/lingering of flavor (score)	2.5	3.4	3.8	3.0	3.8

[0071]

[Table 12]

	Level 6-1	Level 6-2	Level 6-3
Persistence of aftertaste/lingering of flavor (score)	2.3	4.0	3.5

[0072]

<Analysis of peroxide value>

The compositions of Level 2-3 and Level 2-4 in Example 2 and the compositions of Level 3-3 and Level 3-4 in Example 3 were prepared. The compositions were placed and sealed in aluminum pouches, and subjected to accelerated deterioration under constant temperature conditions at 55°C and 75% RH for 3 days. The peroxide values of the compositions were then measured. The peroxide value analysis was outsourced to Japan Food Research Laboratories and conducted by the acetic acid-isooctane method. The results are shown in Tables 13 and 14.

[0073]

[Table 13]

	Level 2-3	Level 2-4
Peroxide value (meq/kg)	88	76

[0074]

[Table 14]

	Level 3-3	Level 3-4
Peroxide value (meq/kg)	85	67

[0075]

In the compositions containing a combination of a flavor component and indigestible dextrin (Level 2-4 and Level 3-4), the peroxide values were lower as compared with the compositions not containing these components (Level 2-3 and Level 3-3). This indicates that the presence of a flavor component and indigestible dextrin in addition to the fat or oil that contains linoleic acid as a constituent fatty acid successfully suppressed oxidative deterioration of the fat or oil that contains linoleic acid as a constituent fatty acid.

[0076]

Some formulation examples of the composition of the present invention are shown below.

[0077]

<Formulation Example 1>

In the production of Level 1-4 in Example 1, the vitamins and minerals described below are used in addition to the raw materials shown in Table 1. A composition is produced in the same manner as in Example 1, except that part of the dextrin in the raw materials of Level 1-4 shown in Table 1 is replaced by the vitamins and minerals described below. Further, part or all of the dextrin may be replaced by components such as L-carnitine and proteins. A matcha-flavored composition can be prepared.

Vitamins: vitamin A, vitamin E, vitamin C, vitamin B1, vitamin B2, niacin, vitamin B6, vitamin B12, folic acid, biotin, and pantothenic acid

Minerals: calcium, phosphorus, iron, iodine, magnesium, copper, zinc, potassium, manganese, and sodium

[0078]

<Formulation Example 2>

In the production of Level 2-4 in Example 2, the vitamins and minerals described in Formulation Example 1 are used in addition to the raw materials shown in Table 2. A composition is produced in the same manner as in Example 2, except that part of the dextrin in the raw materials of Level 2-4 shown in Table 2 is replaced by the vitamins and minerals described above. Further, part or all of the dextrin may be replaced by components such as L-carnitine and proteins. A coffee-flavored composition can be prepared.

[0079]

<Formulation Example 3>

In the production of Level 3-4 in Example 3, the vitamins and minerals

described in Formulation Example 1 are used in addition to the raw materials shown in Table 3. A composition is produced in the same manner as in Example 3, except that part of the dextrin in the raw materials of Level 3-4 shown in Table 3 is replaced by the vitamins and minerals described above. Further, part or all of the dextrin may be replaced by components such as L-carnitine and proteins. A cocoa-flavored composition can be prepared.

[0080]

<Formulation Example 4>

In the production of the compositions of Level 4-2 and Level 4-3 in Example 4, the vitamins and minerals described in Formulation Example 1 are used in addition to the raw materials shown in Table 7. A composition is produced in the same manner as in Example 4, except that part of the dextrin in the raw materials of Level 4-2 and Level 4-3 shown in Table 7 is replaced by the vitamins and minerals described above. Further, part or all of the dextrin may be replaced by components such as L-carnitine and proteins. A matcha-flavored composition can be prepared.

[0081]

<Formulation Example 5>

In the production of Level 5-2 to Level 5-5 in Example 5, the vitamins and minerals described in Formulation Example 1 are used in addition to the raw materials shown in Table 8. A composition is produced in the same manner as in Example 5, except that part of the dextrin in the raw materials of Level 5-2 to Level 5-5 shown in Table 8 is replaced by the vitamins and minerals described above. Further, part or all of the dextrin may be replaced by components such as L-carnitine and proteins. A coffee-flavored composition can be prepared.

[0082]

<Formulation Example 6>

In the production of Level 6-2 and Level 6-3 in Example 6, the vitamins and minerals described in Formulation Example 1 are used in addition to the raw materials shown in Table 9. A composition is produced in the same manner as in Example 6, except that part of the dextrin in the raw materials of Level 6-2 and Level 6-3 shown in Table 9 is replaced by the vitamins and minerals described above. Further, part or all of the dextrin may be replaced by components such as L-carnitine and proteins. A cocoa-flavored composition can be prepared.

[0083]

In Formulation Examples 1 to 6, the vitamins and minerals can be added such

that, for example, the total amount thereof accounts for from 0.5 to 1.5% by weight based on the solid content of the resulting composition. Components such as L-carnitine and proteins can be added such that, for example, the amount thereof accounts for from 4 to 40% by weight based on the solid content of the resulting composition.

The compositions obtained in Formulation Examples 1 to 6 are compositions containing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C), in which an off-flavor of a fat or oil generated during storage is suppressed. The resulting compositions can be used as oral compositions such as foods or beverages. The compositions can also be suitably used as, for example, meal replacement products (MRPs).

CLAIMS

[Claim 1] A composition comprising:
a fat or oil (A) that contains linoleic acid as a constituent fatty acid;
indigestible dextrin (B); and
a flavor component (C).

[Claim 2] The composition according to claim 1,
wherein the flavor component (C) is at least one selected from the group consisting of a coffee extract, matcha, and cocoa powder.

[Claim 3] The composition according to claim 1 or 2,
wherein a weight ratio of an amount of linoleic acid in terms of free linoleic acid to an amount of the indigestible dextrin (B) (linoleic acid/(B)) is 0.01 to 0.5.

[Claim 4] The composition according to claim 1 or 2,
wherein a weight ratio of an amount of linoleic acid in terms of free linoleic acid to an amount of the flavor component (C) (linoleic acid/(C)) is 0.1 to 1.

[Claim 5] The composition according to claim 1 or 2,
wherein the indigestible dextrin (B) is present in an amount of from 5 to 40% by weight based on a solid content.

[Claim 6] The composition according to claim 1 or 2,
wherein the flavor component (C) is present in an amount of from 1 to 10% by weight based on a solid content.

[Claim 7] The composition according to claim 1 or 2,
wherein the fat or oil (A) that contains linoleic acid as a constituent fatty acid is safflower oil.

[Claim 8] The composition according to claim 1 or 2,
wherein the composition is an oral composition.

[Claim 9] The composition according to claim 1 or 2,

wherein the composition is in the form of granules, fine granules, or powder.

[Claim 10] A method for producing the composition according to claim 1 or 2, the method comprising

mixing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C).

[Claim 11] A method for suppressing an off-flavor of a fat or oil that contains linoleic acid as a constituent fatty acid, the method comprising

mixing a fat or oil (A) that contains linoleic acid as a constituent fatty acid, indigestible dextrin (B), and a flavor component (C).