DESCRIPTION

Title of Invention: PLASTIC OIL-AND-FAT COMPOSITION FOR COOKIES, COOKIE DOUGH, METHOD FOR PRODUCING COOKIES, AND METHOD FOR IMPROVING MECHANICAL SUITABILITY OF COOKIE DOUGH

TECHNICAL FIELD

[0001]

The present invention relates to a plastic oil-and-fat composition for cookies, a cookie dough, a method for producing cookies, and a method for improving the mechanical suitability of a cookie dough.

BACKGROUND ART

[0002]

Cookies are confectionery obtained by mixing sugar with an edible oil and fat such as shortening, butter, or margarine, mixing flour or the like into the resulting mixture to prepare a cookie dough, subsequently molding the cookie dough into a suitable shape, and then heating and baking the molded cookie dough. Depending on the method for molding the dough, cookies may be of various types, such as rolled-dough cookies in which the cookie dough is rolled into a plate shape and cut, extruded cookies in which the cookie dough is extruded in a plate shape and cut, or icebox cookies in which the cookie dough is molded into a rod shape, chilled in a refrigerator or the like, and then molded into round slices.

[0003]

The cookie dough needs a proper degree of resilience (plasticity) in order for the dough to be molded into a suitable shape. Specifically, for example, in cases in which rolled-dough cookies or extruded cookies are to be produced, it is necessary to prevent the cookie dough from being torn or ripped partway along a production line before cutting in order for the cookie dough to be pressed and molded into a thin plate shape. Furthermore, in cases in which, for example, machinery is to be used in the production line, the cookie dough needs mechanical suitability so as to be able to withstand the specifications of the machinery used.

[0004]

In response to such problems, Patent Document 1, for example, discloses a plastic oil-and-fat composition for cookies, said plastic oil-and-fat composition being obtained by incorporating 20 mass% or more and 70 mass% or less of beef fat or fractionated beef fat in relation to all components constituting an oil phase. When the plastic oil-and-fat composition is used in a cookie dough, the resilience of the resulting cookie dough is stabilized, and it furthermore is possible to improve the mechanical resistance of the cookie dough at the time of molding (see Patent Document 1 (paragraph [0007])).

Related Art Documents

Patent Documents

[0005]

Patent Document 1: International Publication No. WO 2021/200087

DISCLOSURE OF THE INVENTION

Problems the Invention is Intended to Solve

[0006]

In the technology of Patent Document 1, the aforementioned problems are solved in a cookie dough using beef fat or fractionated beef fat. However, a given proportion of consumers is occupied by those who avoid animal-based food ingredients from the standpoint of vegetarian convictions and religious beliefs in recent years. In view of such circumstances, it is an object of the present invention to solve the aforementioned problems of cookie dough without using beef fat, or while reducing the amount of beef fat used as much as possible.

Means for Solving the Aforementioned Problems

[0007]

In view of the foregoing, the inventors perfected the present invention upon discovering, as a result of thorough investigations, that a plastic oil-and-fat composition in which a interesterified oil having a specific solid fat content and an emulsifier of a specific type are incorporated exhibits an exceptional effect for imparting excellent resilience to cookie dough.

[0008]

Specifically, according to a first aspect, the present invention provides

a plastic oil-and-fat composition for cookies which contains an oil and fat and an emulsifier, the plastic-oil and-fat composition being such that:

the oil and fat includes a liquid oil and a interesterified oil in which the solid fat content at 20°C is 47% or greater and 100% or less; and

the emulsifier includes lecithin, a monoglycerol fatty acid ester, and one or more selected from the group consisting of sorbitan fatty acid esters, polyglycerol fatty acid esters, and sucrose fatty acid esters.

[0009]

In the plastic oil-and-fat composition for cookies described above, the oil and fat may contain 10 mass% or more and 70 mass% or less of the liquid oil, and 30 mass% or more and 90 mass% or less of the interesterified oil.

[0010]

In the plastic oil-and-fat composition for cookies described above, the interesterified oil may include a interesterified oil 1 of an oil-and-fat raw material that includes an oil and fat A and an oil and fat B, and a interesterified oil 2 of an oil-and-fat raw material that includes an oil and fat C and an oil and fat D.

[0011]

Oil and fat A: An oil and fat which has an iodine value of 2 or less and in which the amount of C14 or lower fatty acids among constituent fatty acids is 10 mass% or greater and 85 mass% or less.

Oil and fat B: An oil and fat which has an iodine value of 2 or less and in which the amount of C18 fatty acids among constituent fatty acids is 40 mass% or greater and 90 mass% or less.

Oil and fat C: A fractionated palm oil in which the solid fat content at 35°C is 40% or less.

Oil and fat D: A liquid oil and fat which has a slip melting point of 5°C or lower.

In the plastic oil-and-fat composition for cookies described above, the interesterified oil may include the interesterified oil 1 and the interesterified oil 2 such that the mass ratio of the interesterified oil 2 to the interesterified oil 1 is 0.5 or greater and 7 or less.

[0012]

In the plastic oil-and-fat composition for cookies described above, the emulsifier may include lecithin, a monoglycerol fatty acid ester, and a sorbitan fatty acid ester.

[0013]

In the plastic oil-and-fat composition for cookies described above, the plastic oil-and-fat composition may be used in pressed plate-form cookies.

[0014]

In the plastic oil-and-fat composition for cookies described above, the plastic oil-and-fat composition may be used in cut-out cookies.

[0015]

According to a second aspect, the present invention provides a cookie dough containing the plastic oil-and-fat composition for cookies described above, flour, and sugar.

[0016]

In the cookie dough described above, the hardness thereof, as measured using a texture analyzer (jig: cylinder measuring 40 mm in diameter; stroke: 1.0 mm/sec), may be 15 N or greater and 40 N or less.

[0017]

According to a third aspect, the present invention provides a method for producing cookies, the method including a step for blending the plastic oil-and-fat composition for cookies described above with a cookie dough raw material to obtain a cookie dough, and a step for heating the cookie dough.

[0018]

According to a fourth aspect, the present invention provides a method for improving the mechanical suitability of cookie dough, the method including blending the plastic oil-and-fat composition for cookies described above with a cookie dough raw material to obtain a cookie dough.

Effect of the Invention

[0019]

According to the present invention, it is possible to provide a plastic oil-and-fat composition that is of exceptional quality and is for use in cookies. Blending the plastic oil-and-fat composition provided by the present invention with a cookie dough makes it possible to impart excellent resilience to the dough. In particular, the plastic oil-and-fat composition makes it possible to improve the mechanical suitability of the cookie dough.

MODE FOR CARRYING OUT THE INVENTION

[0020]

The present invention shall be described in further detail below.

Where upper-limit values and lower-limit values for numeric ranges are indicated in the present description, the upper-limit values and lower-limit values can be combined as appropriate, and the numeric ranges obtained thereby are also disclosed.

[0021]

1. Plastic oil-and-fat composition

The plastic oil-and-fat composition according to the present invention includes a liquid oil and a interesterified oil as oils and fats, and furthermore includes an emulsifier.

[0022]

(1) Liquid oil

Examples of the liquid oil include rapeseed oil, soybean oil, sunflower oil, cottonseed oil, peanut oil, rice bran oil, corn oil, safflower oil, olive oil, kapok oil, sesame oil, perilla oil, flaxseed oil, and primrose oil. However, the present invention is not limited to these examples; for example, any liquid oil having a slip melting point of 5°C or lower may be used. One type of liquid oil may be used alone, or two or more types of liquid oils may be used in combination.

[0023]

(2) Interesterified oil

In the present invention, there is used a interesterified oil in which the solid fat content at 20°C is 47% or greater and 100% or less. A commercial variety may be used for the interesterified oil, or a interesterified oil having the aforementioned solid fat content characteristic may be prepared as appropriate.

[0024]

The interesterified oil can be prepared according to a method that would be well known to a person skilled in the art. For example, the interesterified oil can be prepared from a suitable oil-and-fat raw material through random interesterification using sodium methoxide as a catalyst. Examples of the oil-and-fat raw material supplied for interesterification include combinations of oil and fat A and oil and fat B indicated below.

[0025]

Oil and fat A: An oil and fat which has an iodine value of 2 or less and in which the amount of C14 or lower fatty acids among constituent fatty acids is 10 mass% or greater and 85 mass% or less.

Oil and fat B: An oil and fat which has an iodine value of 2 or less and in which the amount of C18 fatty acids among constituent fatty acids is 40 mass% or greater and 90 mass% or less.

[0026]

Examples of the oil and fat A include oils and fats which have an iodine value of 2 or less and are obtained by hydrogenating palm kernel oil, coconut oil, or the like, although the oil and fat A is not limited thereto.

[0027]

Additionally, examples of the oil and fat B include oils and fats which have an iodine value of 2 or less and are obtained by hydrogenating palm oil, rice bran oil, corn oil, soybean oil, or the like, although the oil and fat B is not limited thereto.

[0028]

The iodine values of these oils and fats can be measured in conformance with "2.3.4.1-1996 Iodine value (Wijs-Cyclohexane Method)" in Standard Methods for the Analysis of Fats, Oils and Related Materials (Japan Oil Chemists' Society).

[0029]

Additionally, for example, it is also permissible to use a combination of oil and fat C and oil and fat D indicated below.

[0030]

Oil and fat C: A fractionated palm oil in which the solid fat content at 35°C is 40% or less.

Oil and fat D: A liquid oil and fat which has a slip melting point of 5°C or lower.

[0031]

Examples of the oil and fat C include palm mid-fraction, palm olein, palm double olein, palm stearin, and palm double stearin, and preferred examples include palm stearin and palm mid-fraction, although the oil and fat C is not limited thereto. The solid fat content of the oil and fat C at 35°C is preferably 40% or lower. The solid fat content of the oil and fat C at 35°C may instead be, e.g., 35% or lower, 30% or lower, 20% or lower, 10% or lower, or 5% or lower, although said solid fat content is not limited thereto.

[0032]

Additionally, examples of the oil and fat D include rapeseed oil, soybean oil, sunflower oil, cottonseed oil, peanut oil, rice bran oil, corn oil, and safflower oil, although the oil and fat D is not limited thereto.

[0033]

One type of interesterified oil may be used alone, or two or more types of interesterified oils may be used in combination.

[0034]

According to a given mode, a interesterified oil (which may be referred to below as "interesterified oil 1") of an oil-and-fat raw material that includes the oil and fat A and the oil and fat B, and a interesterified oil (which may be referred to below as "interesterified oil 2") of an oil-and-fat raw material that includes the oil and fat C and the oil and fat D, may be used in combination as the interesterified oil used in the present invention, although the interesterified oil is not limited thereto. In such instances, the mass ratio of the interesterified oil 2 to the interesterified oil 1 is preferably 0.5 or greater and 7 or less. The mass ratio may instead be, e.g., 0.6 or greater and 6 or less, 0.7 or greater and 5 or less, 0.9 or greater and 4 or less, 1.1 or greater and 3.5 or less, or 1.5 or greater and 2.8 or less, although said mass ratio is not limited thereto.

[0035]

Suitably combining two or more different interesterified oils to formulate a mixed oil as described above results in the mixed oil having the desired solid fat content profile, thus making it possible to formulate the interesterified oil used in the present invention.

[0036]

The solid fat content of the interesterified oil used in the present invention at 20°C is to be 47% or higher and 100% or lower, as described above. The solid fat content at 20°C may instead be, e.g., 48% or higher and 98% or lower, 50% or higher and 96% or lower, 52% or higher and 94% or lower, or 53% or higher and 92% or lower, although said solid fat content is not limited thereto. The solid fat content at 10°C may be, e.g., 70% or higher and 100% or lower, 71% or higher and 98% or lower, or 72% or higher and 97% or lower, although said solid fat content is not limited thereto. The solid fat content at 30°C may be, e.g., 27% or higher and 80% or lower, 28% or higher and 75% or lower, 28% or higher and 70% or lower, or 29% or higher and 65% or lower, although said solid fat content is not limited thereto. The solid fat content at 35°C may be, e.g., 17% or higher and 55% or lower, 18% or higher and 50% or lower, 19% or higher and 45% or lower, or 20% or higher and 40% or lower, although said solid fat content is not limited thereto.

[0037]

The solid fat content of the interesterified oil can be measured in conformance with the method under METHOD I disclosed in AOCS Official Method Cd 16b-93.

[0038]

(3) Other edible oils and fats

Other edible oils and fats other than the liquid oil and the interesterified oil described above may be blended with

the plastic oil-and-fat composition, provided that such addition does not hinder the object or effect of the present invention.

[0039]

Examples of other edible oils and fats include: palm oil, palm kernel oil, shea butter, sal fat, cacao butter, coconut oil, palm olein, and other plant-based oils and fats; pig fat (lard), beef fat, chicken fat, rabbit fat, sheep fat, horse fat, fish oil, whale oil, and other animal-based oils and fats; medium-chain fatty acid triglycerides and other synthetic oils; and processed oils and fats obtained by subjecting the foregoing to one or more processes selected from the group consisting of interesterification, hydrogenation, and fractionation.

[0040]

Milk-derived oils and fats may be used as the other oils and fats. The milk-derived oils and fats are not particularly limited; examples thereof include oils and fats contained in raw milk, cow milk, special milk, raw goat milk, sterilized goat milk, raw sheep milk, component-adjusted cow milk, low-fat cow milk, non-fat cow milk, or processed milk. Among the foregoing, it is preferable to use oils and fats contained in butter, anhydric milk fat (also referred to below as "butter oil"), or processed oils and fats such as fractionated oils and fats of these, or combinations of the foregoing, and it is more preferable to use oils and fats contained in butter. One

of the foregoing may be used alone, or two or more may be used in combination. According to a given mode, including a milk-derived oil and fat in the plastic oil-and-fat composition according to the present invention makes it possible to impart a buttery flavor, although the plastic oil-and-fat composition is not limited thereto.

[0041]

It is preferable that the oil and fat constituting the plastic oil-and-fat composition contains 10 mass% or more and 70 mass% or less of the liquid oil described above so that the object and effect of the present invention are not hindered. Additionally, it is preferable that the oil and fat constituting the plastic oil-and-fat composition contains 30 mass% or more and 90 mass% or less of the interesterified oil described above. The liquid oil content of the oil and fat constituting the plastic oil-and-fat composition may be, e.g., 20 mass% or greater and 65 mass% or less, 25 mass% or greater and 60 mass% or less, or 30 mass% or greater and 55 mass% or less, although said liquid oil content is not limited thereto. The interesterified oil content of the oil and fat constituting the plastic oil-and-fat composition may be, e.g., 35 mass% or greater and 80 mass% or less, 40 mass% or greater and 70 mass% or less, or 45 mass% or greater and 65 mass% or less, although said interesterified oil content is not limited thereto.

[0042]

According to a given mode, it is preferable that substantially no beef fat or other animal-based oils and fats are used in the plastic oil-and-fat composition according to the present invention from the standpoint of avoiding animal-based raw materials, although the plastic oil-and-fat composition is not limited thereto. In such instances, the amount of the beef fat or fractionated beef fat, which are known as confectionery ingredients, contained in the oil and fat constituting the plastic oil-and-fat composition is preferably 0 mass% or greater and 5 mass% or less, more preferably 0 mass% or greater and 3 mass% or less, even more preferably 0 mass% or greater and 1 mass% or less, particularly preferably 0 mass% or greater and 0.5 mass% or less, and ideally 0 mass% or greater and 0.1 mass% or less in terms of the total amount of beef fat or fractionated beef fat.

[0043]

(4) Emulsifier

A specific type of emulsifier is used in the present invention. Specifically, lecithin and a monoglycerol fatty acid ester are used, and one or more selected from the group consisting of sorbitan fatty acid esters, polyglycerol fatty acid esters, and sucrose fatty acid esters is furthermore used.

[0044]

Lecithin that is permitted as an edible ingredient is to be selected as appropriate and used as the lecithin, but the type thereof, etc., is not particularly limited. The lecithin may be an animal-based or plant-based substance. Examples of animal-based lecithin include egg yolk lecithin. Examples of plant-based lecithin include soybean lecithin, rapeseed lecithin, sunflower lecithin, cottonseed lecithin, maize lecithin, peanut lecithin, palm lecithin, sesame lecithin, rice bran lecithin, perilla lecithin, and flaxseed lecithin. According to a given mode, the lecithin used in the present invention is preferably plant-based lecithin, although the lecithin is not limited thereto. The lecithin is preferably one or more selected from the group consisting of soybean lecithin, rapeseed lecithin, and sunflower lecithin, and is more preferably soybean lecithin. Generally, lecithin may be of various types, such as crude lecithin (also referred to as raw lecithin or paste lecithin), deoiled lecithin (also referred to as powder lecithin), fractionated lecithin (also referred to as refined lecithin), or enzyme-treated lecithin, depending on production method and phospholipid purity. In the present invention, any type of lecithin may be used, but according to a given mode, it is preferable to use crude lecithin.

[0045]

The lecithin used in the present invention may be configured by selecting one type of lecithin from among

various lecithins and using the selected type alone, or may be configured by using two or more types of lecithin in combination.

[0046]

The lecithin content of the plastic oil-and-fat composition is preferably 0.05 mass% or greater and 0.9 mass% or less. The lecithin content may instead be, e.g., 0.05 mass% or greater and 0.7 mass% or less, 0.05 mass% or greater and 0.5 mass% or less, or 0.1 mass% or greater and 0.3 mass% or less, although the lecithin content is not limited thereto.

[0047]

A monoglycerol fatty acid ester that is permitted as an edible ingredient is to be selected as appropriate and used as the monoglycerol fatty acid ester, but the type thereof, etc., is not particularly limited. The monoglycerol fatty acid ester may have saturated fatty acids or unsaturated fatty acids as constituent fatty acids thereof. Examples of the saturated fatty acids include caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, behenic acid, and lignoceric acid. Examples of the unsaturated fatty acids include palmitoleic acid, oleic acid, linoleic acid, linolenic acid, and erucic acid. According to a given mode, the monoglycerol fatty acid ester used in the present invention preferably has constituent fatty acids selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, palmitoleic acid, oleic acid, linoleic

acid, and linolenic acid, although the monoglycerol fatty acid ester is not limited thereto. The monoglycerol fatty acid ester more preferably has constituent fatty acids selected from the group consisting of palmitic acid, stearic acid, oleic acid, linoleic acid, and linolenic acid, and even more preferably has constituent fatty acids selected from the group consisting of oleic acid, linoleic acid, and linolenic acid.

[0048]

It is known that, generally, the characteristic of the balance between lipophilicity and hydrophilicity of a fatty acid ester is represented by the hydrophilic-lipophilic balance (HLB) thereof, which is a value representing the extent of the affinity of a non-ionic surfactant to water and oil. From this standpoint, the HLB of the monoglycerol fatty acid ester used in the present invention is preferably 1.0 or greater and 8.0 or less. The HLB of the monoglycerol fatty acid ester may instead be, e.g., 2.0 or greater and 6.0 or less, 3.0 or greater and 5.5 or less, or 3.5 or greater and 5.0 or less, although said HLB is not limited thereto. Examples of commercial varieties to be used for the monoglycerol fatty acid ester include "Emulsy HRO" (trade name; HLB: 4.3) made by Riken Vitamin Co., Ltd.

[0049]

The HLB value can be calculated using the Atlas calculation method. "Atlas calculation method" refers to a

method for calculating the HLB value from the following formula.

HLB = 20 × (1 − S/A)

S: Extent of saponification

A: Extent of neutralization of fatty acid in ester

The extent of saponification in the formula above can be measured according to, e.g., "Standard Methods for the Analysis of Fats, Oils and Related Materials 2.3.2," and the extent of neutralization can be measured according to, e.g., "Standard Methods for the Analysis of Fats, Oils and Related Materials 3.3.1."

[0050]

The monoglycerol fatty acid ester used in the present invention may be configured by selecting one type of monoglycerol fatty acid ester from among various monoglycerol fatty acid esters and using the selected type alone, or may be configured by using two or more types of monoglycerol fatty acid ester in combination.

[0051]

The monoglycerol fatty acid ester content of the plastic oil-and-fat composition is preferably 0.05 mass% or greater and 0.9 mass% or less. The monoglycerol fatty acid ester content may instead be, e.g., 0.1 mass% or greater and 0.8 mass% or less, 0.15 mass% or greater and 0.7 mass% or less, 0.2 mass% or greater and 0.5 mass% or less, or 0.2 mass% or

greater and 0.4 mass% or less, although the monoglycerol fatty acid ester content is not limited thereto.

[0052]

A sorbitan fatty acid ester that is permitted as an edible ingredient is to be selected as appropriate and used as the sorbitan fatty acid ester, but the type thereof, etc., is not particularly limited. The sorbitan fatty acid ester may have saturated fatty acids or unsaturated fatty acids as constituent fatty acids thereof. Examples of the saturated fatty acids include caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, behenic acid, and lignoceric acid. Examples of the unsaturated fatty acids include palmitoleic acid, oleic acid, linoleic acid, linolenic acid, and erucic acid. According to a given mode, the sorbitan fatty acid ester used in the present invention preferably has one or more constituent fatty acids selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, and oleic acid, although the sorbitan fatty acid ester is not limited thereto. The sorbitan fatty acid ester more preferably has one or more constituent fatty acids selected from the group consisting of stearic acid, palmitic acid, and oleic acid, and even more preferably has one or two constituent fatty acids selected from the group consisting of stearic acid and palmitic acid.

[0053]

The HLB of the sorbitan fatty acid ester used in the present invention is preferably 1.0 or greater and 7.0 or less. The HLB of the sorbitan fatty acid ester may instead be, e.g., 2.0 or greater and 6.0 or less, 2.5 or greater and 5.5 or less, or 3.0 or greater and 4.5 or less, although said HLB is not limited thereto. Examples of commercial varieties to be used for the sorbitan fatty acid ester include "S-320YN" (trade name; HLB: 4.2) and "S-65V" (trade name; HLB: 3.0) made by Riken Vitamin Co., Ltd.

[0054]

The sorbitan fatty acid ester used in the present invention may be configured by selecting one type of sorbitan fatty acid ester from among various sorbitan fatty acid esters and using the selected type alone, or may be configured by using two or more types of sorbitan fatty acid ester in combination.

[0055]

The sorbitan fatty acid ester content of the plastic oil-and-fat composition is preferably 0.03 mass% or greater and 0.9 mass% or less. The sorbitan fatty acid ester content may instead be, e.g., 0.05 mass% or greater and 0.8 mass% or less, 0.07 mass% or greater and 0.7 mass% or less, 0.07 mass% or greater and 0.6 mass% or less, or 0.09 mass% or greater and 0.4 mass% or less, although the sorbitan fatty acid ester content is not limited thereto.

[0056]

A polyglycerol fatty acid ester that is permitted as an edible ingredient is to be selected as appropriate and used as the polyglycerol fatty acid ester, but the type thereof, etc., is not particularly limited. Examples of the polyglycerol fatty acid ester include diglycerol fatty acid esters having an average degree of polymerization of 2, triglycerol fatty acid esters having an average degree of polymerization of 3, tetraglycerol fatty acid esters having an average degree of polymerization of 4, pentaglycerol fatty acid esters having an average degree of polymerization of 5, hexaglycerol fatty acid esters having an average degree of polymerization of 6, and decaglycerol fatty acid esters having an average degree of polymerization of 10, although the degree of polymerization of the glycerol units of the polyglycerol fatty acid ester is not limited thereto. The polyglycerol fatty acid ester may have saturated fatty acids or unsaturated fatty acids as constituent fatty acids thereof. Examples of the saturated fatty acids include caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, behenic acid, and lignoceric acid. Examples of the unsaturated fatty acids include palmitoleic acid, oleic acid, linoleic acid, linolenic acid, and erucic acid. According to a given mode, the polyglycerol fatty acid ester used in the present invention preferably has one or more constituent fatty acids selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, behenic

acid, and lignoceric acid, although the polyglycerol fatty acid ester is not limited thereto. The polyglycerol fatty acid ester more preferably has one or more constituent fatty acids selected from the group consisting of palmitic acid, stearic acid, arachidic acid, and behenic acid, and even more preferably has behenic acid as a constituent fatty acid.

[0057]

The HLB of the polyglycerol fatty acid ester used in the present invention is preferably 1.0 or greater and 8.0 or less. The HLB of the polyglycerol fatty acid ester may instead be, e.g., 2.0 or greater and 7.0 or less, 3.0 or greater and 6.0 or less, or 4.0 or greater and 5.0 or less, although said HLB is not limited thereto. Examples of commercial varieties to be used for the polyglycerol fatty acid ester include "HB-750" (HLB: 4.2) made by Sakamoto Yakuhin Kogyo Co., Ltd.

[0058]

The polyglycerol fatty acid ester used in the present invention may be configured by selecting one type of polyglycerol fatty acid ester from among various polyglycerol fatty acid esters and using the selected type alone, or may be configured by using two or more types of polyglycerol fatty acid ester in combination.

[0059]

The polyglycerol fatty acid ester content of the plastic oil-and-fat composition is preferably 0.05 mass% or greater and 0.9 mass% or less. The polyglycerol fatty acid ester

content may instead be, e.g., 0.1 mass% or greater and 0.8 mass% or less, 0.2 mass% or greater and 0.75 mass% or less, or 0.3 mass% or greater and 0.7 mass% or less, although the polyglycerol fatty acid ester content is not limited thereto.

[0060]

A sucrose fatty acid ester that is permitted as an edible ingredient is to be selected as appropriate and used as the sucrose fatty acid ester, but the type thereof, etc., is not particularly limited. The sucrose fatty acid ester may have saturated fatty acids or unsaturated fatty acids as constituent fatty acids thereof. Examples of the saturated fatty acids include caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, behenic acid, and lignoceric acid. Examples of the unsaturated fatty acids include palmitoleic acid, oleic acid, linoleic acid, linolenic acid, and erucic acid. According to a given mode, the sucrose fatty acid ester used in the present invention preferably has one or more constituent fatty acids selected from the group consisting of palmitic acid, stearic acid, oleic acid, linoleic acid, linolenic acid, and erucic acid, although the sucrose fatty acid ester is not limited thereto. The sucrose fatty acid ester more preferably has one or more constituent fatty acids selected from the group consisting of linoleic acid, linolenic acid, and erucic acid, and even more preferably has erucic acid as a constituent fatty acid.

[0061]

The HLB of the sucrose fatty acid ester used in the present invention is preferably 0.1 or greater and 8.0 or less. The HLB of the sucrose fatty acid ester may instead be, e.g., 0.5 or greater and 6.0 or less, 0.8 or greater and 4.0 or less, or 1.0 or greater and 2.0 or less, although said HLB is not limited thereto. Examples of commercial varieties to be used for the sucrose fatty acid ester include "Ryoto Sugar Ester ER-290" (trade name; HLB: 2.0) and "Ryoto Sugar Ester POS-135" (trade name; HLB: 1.0) made by Mitsubishi Chemical Corp.

[0062]

The sucrose fatty acid ester used in the present invention may be configured by selecting one type of sucrose fatty acid ester from among various sucrose fatty acid esters and using the selected type alone, or may be configured by using two or more types of sucrose fatty acid ester in combination.

[0063]

The sucrose fatty acid ester content of the plastic oil-and-fat composition is preferably 0.03 mass% or greater and 0.9 mass% or less. The sucrose fatty acid ester content may instead be, e.g., 0.05 mass% or greater and 0.7 mass% or less, 0.07 mass% or greater and 0.5 mass% or less, or 0.1 mass% or greater and 0.3 mass% or less, although the sucrose fatty acid ester content is not limited thereto.

[0064]

(5) Discretionary components

The plastic oil-and-fat composition according to the present invention may contain other components, within a range in which the object and effect of the present invention are not hindered. For example, the plastic oil-and-fat composition may contain: an organic monoglycerol fatty acid ester, a polyglycerol condensed ricinoleic acid ester, a propylene glycol fatty acid ester, a polysorbate, or another emulsifier; a carotene or another colorant; tocopherol, an ascorbic acid ester, or another antioxidant; or a fragrance or other oil-soluble component. The plastic oil-and-fat composition may also contain table salt, a saccharide, various extracts, a processed dairy product, skim milk powder, buttermilk, buttermilk powder, or another non-oil-soluble component.

[0065]

(6) Preparation of plastic oil-and-fat composition

The plastic oil-and-fat composition according to the present invention can be prepared according to a method that would be well known to a person skilled in the art.

[0066]

Specifically, in cases in which, for example, the plastic oil-and-fat composition is an oily composition, the plastic oil-and-fat composition can be prepared by mixing an oil phase that includes the liquid oil and interesterified oil described above, together with a discretionary oil-soluble component

(including other edible oils and fats or emulsifiers that are blended as necessary), under heating as necessary and then kneading the resulting mixture by using a rapid-cooling/kneading device.

[0067]

In cases in which the plastic oil-and-fat composition is an emulsion of a water-in-oil-type oil-and-fat composition or the like, the plastic oil-and-fat composition can be prepared by preparing an oil phase that includes the liquid oil and interesterified oil described above, together with a discretionary oil-soluble component (including other edible oils and fats or emulsifiers that are blended as necessary), and an aqueous phase that includes water and a discretionary non-oil-soluble component, subsequently mixing the oil phase and the aqueous phase under heating as necessary, and then kneading the resulting emulsified substance by using a rapid-cooling/kneading device.

[0068]

Examples of the rapid-cooling/kneading device include perfectors, combinators, votators, and nexuses.

[0069]

(7) Form of plastic oil-and-fat composition

The plastic oil-and-fat composition according to the present invention may be in the form of an oily composition that contains substantially no water, or may be in the form of

an emulsion that contains water, but is preferably in the form of an emulsion.

[0070]

In cases in which the plastic oil-and-fat composition is in the form of an oily composition (e.g., shortening), the total of the amounts of components constituting the oil phase is preferably 85 mass% or greater and 100 mass% or less in relation to the entirety of the plastic oil-and-fat composition. The total of the amounts of components constituting the oil phase may instead be, e.g., 90 mass% or greater and 99.5 mass% or less, or 95 mass% or greater and 99 mass% or less in relation to the entirety of the plastic oil-and-fat composition, although said total is not limited thereto. The water content of the plastic oil-and-fat composition is preferably 1 mass% or less.

[0071]

In cases in which the plastic oil-and-fat composition is in the form of an emulsion, the plastic oil-and-fat composition is preferably a water-in-oil-type oil-and-fat composition (margarine) in which an aqueous phase is dispersed in an oil phase that serves as a continuous phase.

[0072]

In cases in which the plastic oil-and-fat composition is in the form of a water-in-oil-type oil-and-fat composition, the total of the amounts of components constituting the oil phase is preferably 50 mass% or greater and 95 mass% or less

in relation to the entirety of the plastic oil-and-fat composition. The total of the amounts of components constituting the oil phase may instead be, e.g., 60 mass% or greater and 93 mass% or less, 70 mass% or greater and 90 mass% or less, or 80 mass% or greater and 90 mass% or less in relation to the entirety of the plastic oil-and-fat composition, although said total is not limited thereto.

[0073]

Additionally, in cases in which the plastic oil-and-fat composition according to the present invention is in the form of a water-in-oil-type oil-and-fat composition, the water content of the plastic oil-and-fat composition is preferably 3 mass% or greater and 30 mass% or less. The water content of the plastic oil-and-fat composition may instead be, e.g., 5 mass% or greater and 20 mass% or less, or 7 mass% or greater and 18 mass% or less, although said water content is not limited thereto.

[0074]

(8) Solid fat content

The solid fat content of the components constituting the oil phase of the plastic oil-and-fat composition according to the present invention at 20°C is preferably 10% or greater and 45% or less. The solid fat content at 20°C may instead be, e.g., 10% or greater and 40% or less, 15% or greater and 35% or less, or 20% or greater and 30% or less, although said solid fat content is not limited thereto. The solid fat

content of the components constituting the oil phase of the plastic oil-and-fat composition at 10°C is preferably 30% or greater and 65% or less. The solid fat content at 10°C may instead be, e.g., 30% or greater and 60% or less, 35% or greater and 55% or less, or 40% or greater and 50% or less, although said solid fat content is not limited thereto. The solid fat content of the components constituting the oil phase of the plastic oil-and-fat composition at 30°C is preferably 5% or greater and 35% or less. The solid fat content at 30°C may instead be, e.g., 6% or greater and 30% or less, 8% or greater and 25% or less, or 10% or greater and 20% or less, although said solid fat content is not limited thereto. The solid fat content of the components constituting the oil phase of the plastic oil-and-fat composition at 35°C is preferably 1% or greater and 30% or less. The solid fat content at 35°C may instead be, e.g., 3% or greater and 25% or less, 4% or greater and 20% or less, or 5% or greater and 15% or less, although said solid fat content is not limited thereto.

[0075]

The solid fat content of the components constituting the oil phase of the plastic oil-and-fat composition can be measured according to a method that would be well known to a person skilled in the art. For example, the components can be introduced into a thermostatic oven set to a prescribed temperature (e.g., 70°C), and an oil fraction of the plastic oil-and-fat composition can be melted and passed through

filter paper to recover the oil fraction, after which the solid fat content of the oil fraction can be measured in conformance with the method under METHOD I disclosed in AOCS Official Method Cd 16b-93. Alternatively, the solid fat content of the components constituting the oil phase of the plastic oil-and-fat composition can be identified by preparing a mixed oil in a blend identical to that of the oil and fat constituting the plastic oil-and-fat composition (mixed oil of the liquid oil and interesterified oil constituting the present invention, together with other edible oils and fats that are blended as necessary), and then measuring the solid fat content in conformance with the method described above.

[0076]

2. Cookie dough and cookies

The plastic oil-and-fat composition according to the present invention is suitably used as an ingredient for obtaining a cookie dough and cookies. Specifically, the cookie dough and cookies with which the plastic oil-and-fat composition according to the present invention is blended can be produced in the manner described below.

[0077]

Ordinarily, cookie dough contains at least flour, an oil and fat, and sugar. In the cookie dough according to the present invention, the plastic oil-and-fat composition described above is to be incorporated in addition to said oil and fat or in lieu of some or all of the oil and fat.

[0078]

Examples of the flour include wheat flour, rice flour, soybean flour, rye flour, barley flour, and maize flour.

[0079]

The wheat flour is not particularly limited, provided that the wheat flour is to be used in cookies. For example, bread flour, all-purpose flour, cake flour, or a combination of these can be used as the wheat flour. However, the wheat flour preferably includes cake flour.

[0080]

The rice flour is not particularly limited, provided that the rice flour is to be used in cookies. For example, non-glutinous rice flour can be used as the rice flour.

[0081]

The soybean flour is not particularly limited, provided that the soybean flour is to be used in cookies. For example, whole-fat soybean flour, defatted soybean flour, or a combination of these can be used as the soybean flour.

[0082]

The rye flour, the barley flour, and the maize flour are not particularly limited, provided that said flours are to be used in cookies.

[0083]

One of these flours may be used alone, or two or more flours may be used in combination.

[0084]

In the cookie dough, it is preferable that 30 parts by mass or more and 90 parts by mass or less of the plastic oil-and-fat composition described above be blended per 100 parts by mass of the flour. The blending amount of the plastic oil-and-fat composition may instead be, e.g., 40 parts by mass or greater and 80 parts by mass or less, or 50 parts by mass or greater and 70 parts by mass or less per 100 parts by mass of the flour, but said blending amount is not limited thereto. It is also preferable that 10 parts by mass or more and 70 parts by mass or less of sugar be blended per 100 parts by mass of the flour. The blending amount of the sugar may instead be, e.g., 20 parts by mass or greater and 60 parts by mass or less, or 30 parts by mass or greater and 50 parts by mass or less per 100 parts by mass of the flour, but said blending amount is not limited thereto.

[0085]

It is also permissible to furthermore add one or more among eggs, water, emulsifiers, cheese, raw cream, synthetic cream, yogurt, whole milk powder, skim milk powder, whey, casein, cow milk, concentrated milk, synthetic milk, table salt, yeast, starch, leavening agents, sweeteners, flavor powders, quality improvers, gluten, chocolate liquor, cocoa powder, chocolate, coffee, black tea, green tea, vegetables, fruits, nuts, fruit juice, jam, fruit sauce, meat, fish, pulses, roasted soy flour, tofu, soy milk, soybean protein, seasonings, spices, colorants, and flavorings to the cookie

dough, in addition to the plastic oil-and-fat composition, flour, and sugar described above. The blending amounts for these components are to be determined as appropriate in accordance with the practical application and object thereof.

[0086]

The specific steps for preparing the cookie dough are to be configured such that the plastic oil-and-fat composition described above is blended with a cookie dough raw material to obtain a cookie dough, and are not particularly limited. For example, the cookie dough can be prepared by using a widely known method such as a sugar batter method, a flour batter method, or an all-in-mix method. The sugar batter method includes first mixing the sugar and the plastic oil-and-fat composition, and then mixing other ingredients such as eggs or flour into the resulting mixture. The flour batter method includes first mixing the flour and the plastic oil-and-fat composition, and then mixing other ingredients such as eggs or sugar into the resulting mixture. The all-in-mix method includes mixing the ingredients other than the plastic oil-and-fat composition, and finally mixing the melted plastic oil-and-fat composition into the resulting mixture. These widely known methods can be employed as appropriate in accordance with the type of cookies being produced, the required characteristics thereof, or the like.

[0087]

According to a given mode, the hardness of the cookie dough obtained by blending the plastic oil-and-fat composition according to the present invention, as measured using a texture analyzer (jig: cylinder measuring 40 mm in diameter; stroke: 1.0 mm/sec), is preferably 15 N or greater and 40 N or less, although said hardness is not limited thereto. The hardness of the cookie dough may instead be, e.g., 18 N or greater and 40 N or less, or 20 N or greater and 35 N or less, although said hardness is not limited thereto.

[0088]

Cookies can be produced by heating the cookie dough described above. The heating method and heating conditions for the cookie dough are not particularly limited. The cookie dough may be baked in an oven or the like. The heating temperature is to be determined as appropriate in accordance with the type of cookies being produced, the required characteristics thereof, or the like. The heating temperature may be, e.g., 150°C or higher and 250°C or lower, more preferably 170°C or higher and 240°C or lower, and even more preferably 180°C or higher and 220°C or lower, although the heating temperature is not limited thereto.

[0089]

3. Method for improving mechanical suitability of cookie dough

According to a given aspect, the present invention provides a method for improving the mechanical suitability of

a cookie dough. Specifically, the plastic oil-and-fat composition according to the present invention is blended with a cookie dough raw material to obtain a cookie dough, whereby excellent resilience is imparted to the dough, and a cookie dough having improved mechanical suitability is obtained.

[0090]

Herein, "mechanical suitability" is the property of being able to withstand the machinery used. Additionally, "resilience" refers to the plasticity of the cookie dough; i.e., the characteristic whereby the cookie dough deforms in response to receiving external force and retains the deformed shape.

[0091]

The plastic oil-and-fat composition according to the present invention is as described in "1. Plastic oil-and-fat composition" above. The method for blending said plastic oil-and-fat composition with a cookie dough raw material to obtain a cookie dough is as described in "2. Cookie dough and cookies" above.

[0092]

In the present invention, the cookie dough of which the mechanical suitability can be improved is not particularly limited, and may be a cookie dough for rolled-dough cookies, extruded cookies, icebox cookies, or the like. In rolled-dough cookies and extruded cookies from among the foregoing, it is necessary to prevent the cookie dough from being torn or

ripped partway along a production line before cutting in order for the cookie dough to be pressed and molded into a thin plate shape. Furthermore, in cases in which, for example, machinery is to be used in the production line, the cookie dough needs sufficient resilience so as to be able to withstand the specifications of the machinery used.

[0093]

The plastic oil-and-fat composition according to the present invention is capable of imparting excellent resilience to cookie dough, and therefore is particularly useful for improving the mechanical suitability of dough for such pressed plate-form cookies.

[0094]

The mechanical suitability of the cookie dough can be evaluated according to, e.g., the method described in the examples below. Specifically, for example, the mechanical suitability can be evaluated according to the time until the cookie dough breaks in a scenario in which the cookie dough is rolled into a plate shape of a prescribed thickness (3.5 mm) and the edge of the dough is raised to a given height (10 cm) within one second.

[0095]

However, in general in cases in which cut-out cookies are to be produced, the cookie dough is cut out on the production line, after which cookie dough residue is allowed to remain on a return conveyor while the dough is kept in a state of having

been cut by a cookie cutter, and the residue is sent back to a hopper and reused as cookie dough. The cut-out cookie dough is recovered on a rolling conveyor. In such instances, the cookie dough residue needs to be allowed to remain on the return conveyor and sent back to the hopper without following the dough that is cut out by the cookie cutter and recovered on the rolling conveyor. Inasmuch as such cutting-out properties are required, if the resilience of the cookie dough is too high, the cookie dough will be unable to follow the movement of the return conveyor and will end up separating from the return conveyor. Conversely, if the resilience of the cookie dough is too low, the cookie dough will not readily separate from the rolling conveyor or the return conveyor.

[0096]

The plastic oil-and-fat composition according to the present invention is capable of furthermore imparting a proper degree of stickiness as well as a proper degree of resilience with appropriate hardness to cookie dough, and therefore is particularly useful in the mechanical production of such cut-out cookies.

[Examples]

[0097]

The present invention is described in further detail below by way of examples, but the present invention is in no way limited by these examples.

[0098]

(1. Materials)

(Oils and fats)

- Rapeseed oil: made by J-Oil Mills, Inc.
- Soybean oil: made by J-Oil Mills, Inc.
- Beef fat: trade name "Edible beef fat," made by Ueda Oils and Fats Manufacturing Co., Ltd.
- Palm olein: made by J-Oil Mills, Inc.
- Interesterified oil 1: preparation described below
- Interesterified oil 2: preparation described below
- Interesterified oil 3: trade name "Parkid Y," made by Fuji Oil Co., Ltd.
- Hardened oil: trade name "High-erucic hardened rapeseed oil RPh70," made by J-Oil Mills, Inc.
- Hardened oil: trade name "Partially hardened soybean oil BO32," made by J-Oil Mills, Inc.
- Palm oil: made by J-Oil Mills, Inc.

[0099]

(Emulsifiers)

- Lecithin: trade name "Lecithin FA" (crude soybean lecithin), made by J-Oil Mills, Inc.
- Monoglycerol fatty acid ester: trade name "Emulsy HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
- Sorbitan fatty acid ester: trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.

- Sorbitan fatty acid ester: trade name "S-65V" (HLB: 3.0), made by Riken Vitamin Co., Ltd.
- Polyglycerol fatty acid ester: trade name "HB-750" (HLB: 4.2), made by Sakamoto Yakuhin Kogyo Co., Ltd.
- Sucrose fatty acid ester: trade name "ER-290" (HLB: 2.0), made by Mitsubishi Chemical Corp.

[0100]

(2. Preparation of plastic oil-and-fat composition)

The oils and fats were melted and mixed (approximately 60°C), and an emulsifier was admixed with the resulting mixture, to obtain an oil phase.

Next, water was added and mixed with the oil phase while kept at approximately 60°C to obtain an emulsion liquid.

The resulting emulsion liquid was rapidly cooled and kneaded using a perfector so that the temperature during filling was 15°C to obtain a plastic oil-and-fat composition.

[0101]

(3. Solid fat content (SFC))

The solid fat content (SFC) (%) at each of 10°C, 20°C, 30°C, and 35°C was measured in conformance with the method under METHOD I disclosed in AOCS Official Method Cd 16b-93 in accordance with an ordinary method. The SFC of the plastic oil-and-fat composition was measured for a molten mixture of the oils and fats prior to addition of the emulsifier.

[0102]

(4. Method for measuring iodine value)

The iodine values of ultrahardened palm kernel oil and ultrahardened palm oil were measured according to "2.3.4.1-1996 Iodine value (Wijs-Cyclohexane Method)" in Standard Methods for the Analysis of Fats, Oils and Related Materials (Japan Oil Chemists' Society).

[0103]

(5. Hardness of plastic oil-and-fat composition)

The hardness of the plastic oil-and-fat composition was measured as described below.

A sample measuring approximately 400 g was formed into a sheet having a thickness of 5 cm or greater and was allowed to stand for 72 hours or more. The hardness of the sheet-form sample was measured using EZ-SX, made by Shimadzu Corp., by employing a cylindrical jig measuring 40 mm in diameter, with a stroke of 20 mm at 1.0 mm/sec, and an average value on a five-point scale was calculated. The coefficient of variation was 0.1 or lower.

[0104]

(6. Preparation of cookie dough and cookies)

A cookie dough and cookies were prepared according to the following procedure.

[0105]

First, 200 g of caster sugar was added to 300 g of the plastic oil-and-fat composition, and the resulting combination was mixed at low speed for 1 minute using a Hobart mixer (made

by Hobart Canada), after which a dough was scraped up and further mixing was performed at low speed for 1 minute.

[0106]

Next, 50 g of whole eggs was added at once, and the resulting combination was mixed at low speed until an emulsion formed.

[0107]

Subsequently, 500 g of cake flour was added, 40 inching cycles were performed, and the resulting combination was then mixed at low speed for 10 seconds.

[0108]

The resulting dough was clumped together, placed in a bag, stretched out into a rectangular shape, and allowed to stand overnight at 12°C.

[0109]

The resulting dough was then kneaded 30 times and molded into a rectangular shape measuring 17 cm × 19 cm.

[0110]

The dough was rolled three times using a reverse sheeter so as to sequentially reach a thickness of 30 mm, 20 mm, and 10 mm.

[0111]

The dough that had been rolled to 10 mm was cut to a size of 18 cm × 30 cm, and the cut dough was rolled three times using the reverse sheeter so as to sequentially reach a thickness of 7 mm, 5 mm, and 3.5 mm.

[0112]

The dough having a thickness of 3.5 mm was cut to a size of 30 cm × 40 cm and cut out using a circular cookie cutter having a diameter of 6.2 cm at intervals of 15 mm, holes were formed in the circular pieces using a bamboo skewer, and the circular pieces were baked for 10.5 minutes in an oven having an upper burner at 180°C and a lower burner at 180°C to obtain cookies.

[0113]

(7. Hardness of cookie dough)

The hardness of the cookie dough was measured as described below.

The dough was filled into a cylindrical container having a diameter of 35 mm and a height of 10 mm. The hardness of the cookie dough was measured using EZ-SX, made by Shimadzu Corp., by employing a cylindrical jig measuring 40 mm in diameter, with a stroke of 20 mm at 1.0 mm/sec, and an average value on a five-point scale was calculated. The coefficient of variation was 0.1 or lower.

[0114]

(8. Evaluation method)

(1) Resilience of cookie dough

Measurement was carried out in regard to the time until the cookie dough broke in a scenario in which the edge of the cookie dough remaining after cutting-out was manually raised to 10 cm from below within one second, and the measured time

was evaluated according to the evaluation criteria described below.

[0115]

5: Cookie dough did not break in 15 seconds or more: very good

4: Cookie dough did not break in 10 seconds or more but less than 15 seconds: good

3: Cookie dough did not break in 5 seconds or more but less than 10 seconds: good

2: Cookie dough broke in 3 seconds or more but less than 5 seconds

1: Cookie dough broke in less than 3 seconds

A rating of 3 or higher for cookie dough resilience was regarded as an acceptable result.

[0116]

(2) Stickiness of cookie dough

The tactile feel in a scenario in which the resulting cookie dough was pressed with an index finger and separated therefrom was evaluated according to the evaluation criteria described below.

[0117]

4: Sensation of adhering to finger observed: very good stickiness observed

3: Sensation of lightly adhering to finger observed: good stickiness observed

2: Sensation of barely adhering to finger observed: stickiness somewhat lacking

1: Substantially no adhesion to finger observed: stickiness lacking

A rating of 3 or higher for cookie dough stickiness was regarded as an acceptable result.

[0118]

(3) Cuttability of cookie dough

The number of pieces of dough that adhered to the cookie cutter in a scenario in which 20 pieces of cookie dough were cut out was measured and evaluated according to the evaluation criteria described below.

[0119]

4: 20

3: 15 or more but less than 20

2: 10 or more but less than 15

1: Less than 10

A rating of 3 or higher for cookie dough cuttability was regarded as an acceptable result.

[0120]

(4) Mouthfeel of cookies

The resulting cookies were sampled by three panel experts, the crunchiness and hardness of the cookies were evaluated according to the evaluation criteria described below, and average values therefor were employed as evaluation values.

[0121]

a) Crunchiness

4: Very crunchy: good

3: Crunchy: good

2: Somewhat low crunchiness

1: Low crunchiness

A rating of 3 or higher for cookie crunchiness was regarded as an acceptable result.

[0122]

b) Hardness

4: Proper hardness: very good

3: Proper hardness: good

2: Somewhat hard

1: Hard: inferior mouthfeel

A rating of 3 or higher for cookie hardness was regarded as an acceptable result.

[0123]

[Test example 1]

The characteristics of the interesterified oils used in the present test were compared.

[0124]

Representative preparation examples for the interesterified oils were as described below.

[0125]

(Interesterified oil 1)

As a catalyst, 0.3 parts by mass of sodium methoxide was added to 100 parts by mass of an oil-and-fat compound obtained by blending 70 parts by mass of ultrahardened palm kernel oil (iodine value: 0.5) and 30 parts by mass of ultrahardened palm oil (iodine value: 0.5), and the resulting combination was subjected to random interesterification under stirring for 60 minutes at 80°C and a degree of vacuum of 2.7 kPa. After the random interesterification, washing with water was performed to remove the catalyst, a decoloration process was carried out using activated clay, and a deodorization process was furthermore carried out through steam distillation.

[0126]

(Interesterified oil 2)

As a catalyst, 0.3 parts by mass of sodium methoxide was added to 100 parts by mass of an oil-and-fat compound obtained by blending 39 parts by mass of palm stearin (solid fat content at 35°C: 30%), 49 parts by mass of palm mid-fraction (solid fat content at 35°C: 0%), and 12 parts by mass of soybean oil, and the resulting combination was subjected to random interesterification under stirring for 60 minutes at 80°C and a degree of vacuum of 2.7 kPa. After the random interesterification, washing with water was performed to remove the catalyst, a decoloration process was carried out using activated clay, and a deodorization process was furthermore carried out through steam distillation.

[0127]

(Interesterified oil 3)

- Trade name "Parkid Y," made by Fuji Oil Co., Ltd. ("Interesterified oil B" in WO 2021/200087)

[0128]

(Interesterified oil 4)

- "Interesterified oil A" in WO 2021/200087

As a catalyst, 0.3 parts by mass of sodium methoxide was added to 100 parts by mass of an oil-and-fat compound obtained by blending 75 parts by mass of palm stearin, 10 parts by mass of palm oil, and 15 parts by mass of soybean oil, and the resulting combination was subjected to random interesterification under stirring for 60 minutes at 80°C and a degree of vacuum of 2.7 kPa. After the random interesterification, washing with water was performed to remove the catalyst, a decoloration process was carried out using activated clay, and a deodorization process was furthermore carried out through steam distillation.

[0129]

The solid fat content (SFC) of the interesterified oils at 10°C, 20°C, 30°C, and 35°C was measured.

[0130]

The results are shown in table 1.

[0131]

[Table 1]

[Table 1] (Characteristics of interesterified oils)

	Interesterified oil 1[(1)]	Interesterified oil 2[(2)]	Interesterified oil 3[(3)]	Interesterified oil 4[(4)]
Solid fat content (10°C) (%)	96.0	73.8	59.3	69.0
Solid fat content (20°C) (%)	91.0	54.5	30.8	45.5
Solid fat content (30°C) (%)	62.0	30.5	9.1	26.0
Solid fat content (35°C) (%)	36.0	21.5	2.5	16.0

Interesterified oil 1[(1)]: Produced by blending 70 parts by mass of ultrahardened palm kernel oil (iodine value: 0.5) and 30 parts by mass of ultrahardened palm oil (iodine value: 0.5), subsequently subjecting the resulting combination to random interesterification using sodium methoxide as a catalyst, and furthermore refining the resulting substance.

Interesterified oil 2[(2)]: Produced by blending 39 parts by mass of palm stearin, 49 parts by mass of palm mid-fraction, and 12 parts by mass of soybean oil, subsequently subjecting the resulting combination to random interesterification using sodium methoxide as a catalyst, and furthermore refining the resulting substance.

Interesterified oil 3[(3)]: Trade name "Parkid Y," made by Fuji Oil Co., Ltd. ("Interesterified oil B" in WO 2021/200087)

Interesterified oil 4[(4)]: "Interesterified oil A" in WO 2021/200087

[0132]

As shown in table 1, interesterified oil 1 and interesterified oil 2 tended to have a higher SFC (%) than the interesterified oil "Parkid Y" and the "Interesterified oil A" disclosed in WO 2021/200087 at the same temperature. It is considered that one factor in this difference was the use in the former of materials that tended to have a higher SFC as oil-and-fat raw materials supplied for interesterification over those in the latter.

[0133]

[Test example 2]

The characteristics of the oils and fats used in the present test were compared. Specifically, mixed oils were prepared using the various oil-and-fat blends shown in table 2, and the SFC at 10°C, 20°C, 30°C, and 35°C was measured.

[0134]

The results are shown in table 2.

[0135]

[Table 2]

[Table 2] (Characteristics of mixed oils)

		Mixed oil 1	Mixed oil 2	Mixed oil 3	Mixed oil 4	Mixed oil 5	Mixed oil 6	Mixed oil 7	Mixed oil 8
		Oil-and-fat blend 1	Oil-and-fat blend 2	Oil-and-fat blend 3	Oil-and-fat blend 4	Oil-and-fat blend 5	Oil-and-fat blend 6	Oil-and-fat blend 7	Oil-and-fat blend 8
Raw material of mixed oil (blend: parts by mass)	Feature of oil and fat								
Rapeseed oil	Liquid oil	17	20	49	29	45	45	45	
Soybean oil									45
Interesterified oil 1[(1)]	Interesterified oil					18.3	27.5	13.8	18.3
Interesterified oil 2[(2)]		17	40			36.7	27.5	41.2	36.7
Interesterified oil 3[(3)]		26							
High-erucic hardened rapeseed oil RPh70	Hardened oil				3				
Partially hardened soybean oil BO32				36	68				
Palm oil	Palm-based oil and fat			15					
Palm olein			20						
Beef fat	Animal-based fat	40	20						
(Total)		100	100	100	100	100	100	100	100

(Interest. oil 1/Interest. oil 2	—	—	—	—	2.0	1.0	3.0	2.0
Solid fat content (10°C) (%)	44.6	44.9	24.0	40.5	44.5	48.2	42.7	44.7
Solid fat content (20°C) (%)	26.2	25.7	16.9	15.0	23.4	26.9	21.9	23.9
Solid fat content (30°C) (%)	12.0	10.9	9.2	8.8	11.3	15.4	9.3	11.1
Solid fat content (35°C) (%)	7.3	6.1	3.1	3.6	7.2	10.7	5.6	7.5

Interesterified oil 1[(1)]: Produced by blending 70 parts by mass of ultrahardened palm kernel oil (iodine value: 0.5) and 30 parts by mass of ultrahardened palm oil (iodine value: 0.5), subsequently subjecting the resulting combination to random interesterification using sodium methoxide as a catalyst, and furthermore refining the resulting substance.

Interesterified oil 2[(2)]: Produced by blending 39 parts by mass of palm stearin, 49 parts by mass of palm mid-fraction, and 12 parts by mass of soybean oil, subsequently subjecting the resulting combination to random interesterification using sodium methoxide as a catalyst, and furthermore refining the resulting substance.

Interesterified oil 3[(3)]: Trade name "Parkid Y," made by Fuji Oil Co., Ltd. ("Interesterified oil B" in WO 2021/200087)

[0136]

As shown in table 2, using a interesterified oil, a hardened oil, or a palm-based oil as appropriate in lieu of beef fat yielded a mixed oil having SFC characteristics at 10°C, 20°C, 30°C, and 35°C similar to those of mixed oil 1 and mixed oil 2 in which beef fat was blended (except in the case of mixed oil 3).

[0137]

[Test example 3]

Plastic oil-and-fat compositions were prepared using various blends of oils and fats and emulsifiers as shown in table 3.

[0138]

[Table 3]

[Table 3] (Plastic oil-and-fat compositions)

		Preparation example 1	Preparation example 2	Preparation example 3	Preparation example 4
		Oil-and-fat compound 1	Oil-and-fat compound 2	Oil-and-fat compound 3	Oil-and-fat compound 4
		With beef fat	With beef fat	—	—
Raw material of plastic oil-and-fat composition (blend: parts by mass)	Feature of raw material				
Oil and fat	Oil phase	83.595	83.595	83.595	83.395
Water	Aqueous phase	16	16	16	16
Lecithin(3)	Emulsifier	0.16	0.16	0.16	0.16
Monoglycerol fatty acid ester(3)		0.245	0.245	0.245	0.245
Sorbitan fatty acid ester(3)					0.2
(Total)		100	100	100	100

Lecithin(1): Trade name "Lecithin FA" (Crude soybean lecithin), made by J-Oil Mills, Inc.
Monoglycerol fatty acid ester(2): Trade name "Emulsy-HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester(3): Trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.

[Table 3] (cont.)

[Table 3] (Plastic oil-and-fat compositions)

		Preparation example 5	Preparation example 6	Preparation example 7	Preparation example 8
		Oil-and-fat compound 5	Oil-and-fat compound 6	Oil-and-fat compound 7	Oil-and-fat compound 8
		With interesterified oil	With interesterified oil	With interesterified oil	With interesterified oil
Raw material of plastic oil-and-fat composition (blend: parts by mass)	Feature of raw material				
Oil and fat	Oil phase	83.395	83.395	83.395	83.395
Water	Aqueous phase	16	16	16	16
Lecithin(3)	Emulsifier	0.16	0.16	0.16	0.16
Monoglycerol fatty acid ester(3)		0.245	0.245	0.245	0.245
Sorbitan fatty acid ester(3)		0.2	0.2	0.2	0.2
(Total)		100	100	100	100

Lecithin(1): Trade name "Lecithin FA" (Crude soybean lecithin), made by J-Oil Mills, Inc.
Monoglycerol fatty acid ester(2): Trade name "Emulsy-HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester(3): Trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.

[0139]

Additionally, a cookie dough and cookies were prepared using the blend shown in table 4.

[0140]

[Table 4]

[Table 4] (Cookie dough)

Raw material	Blending amount (g)
Plastic oil-and-fat composition according to any one of preparation examples 1 to 8	300
Caster sugar	200
Table salt	2.5
Whole eggs	50
Cake flour	500
Baking powder	5
(Total)	1057.5

[0141]

Table 5 shows the results of evaluation according to (5. Hardness of plastic oil-and-fat composition), (7. Hardness of cookie dough), and (8. Evaluation method) above, together with the blends of the plastic oil-and-fat compositions shown in table 3.

[0142]

[Table 5]

[Table 5] (Evaluation results)

		Reference example 1	Reference example 2	Comparative example 1	Comparative example 2
		Preparation example 1	Preparation example 2	Preparation example 3	Preparation example 4
		With beef fat	With beef fat	—	—
Raw material of plastic oil-and-fat composition (blend: parts by mass)	Feature of raw material				
Oil and fat	Oil phase	83.595	83.595	83.595	83.395
Water	Aqueous phase	16	16	16	16
Lecithin(3)	Emulsifier	0.16	0.16	0.16	0.16
Monoglycerol fatty acid ester(3)		0.245	0.245	0.245	0.245
Sorbitan fatty acid ester(3)					0.2
(Total)		100	100	100	100
Hardness of plastic oil-and-fat composition (N)		0.49	0.63	0.24	0.46
Hardness of cookie dough (N)		19.05	40.04	11.93	24.79
Resilience of cookie dough		4	4	1	3
Stickiness of cookie dough		4	4	2	2
Cuttability of cookie dough		4	3	1	2
Crunchiness of cookies		4	4	2	3
Hardness of cookies		4	4	1	3

Lecithin[1]: Trade name "Lecithin FA" (Crude soybean lecithin), made by J-Oil Mills, Inc.
Monoglycerol fatty acid ester[2]: Trade name "Emulsy-HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester[3]: Trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.

[Table 5] (cont.)

[Table 5] (Evaluation results)

		Example 1	Example 2	Example 3	Example 4
		Preparation example 5	Preparation example 6	Preparation example 7	Preparation example 8
		With interesterified oil	With interesterified oil	With interesterified oil	With interesterified oil
Raw material of plastic oil-and-fat composition (blend: parts by weight)	Feature of raw material				
Oil and fat	Oil phase	83.395	83.395	83.395	83.395
Water	Aqueous phase	16	16	16	16
Lecithin[3]	Emulsifier	0.16	0.16	0.16	0.16
Monoglycerol fatty acid ester[3]		0.245	0.245	0.245	0.245
Sorbitan fatty acid ester[3]		0.2	0.2	0.2	0.2
(Total)		100	100	100	100
Hardness of plastic oil-and-fat composition (N)		0.51	0.60	0.49	0.53
Hardness of cookie dough (N)		23.68	30.49	32.93	29.98
Resilience of cookie dough		4	3	4	4

Stickiness of cookie dough	4	3	3	4
Cuttability of cookie dough	4	4	3	4
Crunchiness of cookies	4	3	3	4
Hardness of cookies	4	3	4	4

Lecithin(1): Trade name "Lecithin FA" (Crude soybean lecithin), made by J-Oil Mills, Inc.
Monoglycerol fatty acid ester(2): Trade name "Emulsy-HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester(3): Trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.

[0143]

As shown in table 5, the effect of improving cookie dough and cookies that was observed with the plastic oil-and-fat compositions in which beef fat was blended (reference example 1 and reference example 2) was substantially not obtained with the plastic oil-and-fat composition in which no beef fat was blended (comparative example 1). Additionally, even with the plastic oil-and-fat composition in which a sorbitan fatty acid ester was blended as an emulsifier without blending beef fat therewith, the stickiness and cuttability of the cookie dough were evaluated to be inferior (comparative example 2). However, with the plastic oil-and-fat compositions in which beef fat was not blended but in which a specific substance was used as a interesterified oil and in which a sorbitan fatty acid ester was blended as an emulsifier, the effect of improving cookie dough and cookies that was observed with the plastic oil-and-fat compositions in which beef fat was blended was able to be reproduced overall (examples 1 to 4).

[0144]

[Test example 4]

Plastic oil-and-fat compositions were prepared using various blends of oils and fats and emulsifiers as shown in table 6.

[0145]

[Table 6]

[Table 6] (Plastic oil-and-fat compositions)

		Preparation example 9	Preparation example 10	Preparation example 11	Preparation example 12	Preparation example 13	Preparation example 14
		Oil-and-fat blend 5	Oil-and-fat blend 5	Oil-and-fat blend 5	Oil-and-fat blend 5	Oil-and-fat blend 5	Oil-and-fat blend 5
		With inter-esterified oil	With inter-esterified oil	With inter-esterified oil	With inter-esterified oil	With inter-esterified oil	With inter-esterified oil
Raw material of plastic oil-and-fat composition (blend: parts by mass)	Feature of raw material						
Oil and fat	Oil phase	83.595	83.495	83.095	83.095	83.395	83.195
Water	Aqueous phase	16	16	16	16	16	16
Lecithin(1)	Emulsifier	0.16	0.16	0.16	0.16	0.16	0.16
Monoglycerol fatty acid ester(2)		0.245	0.245	0.245	0.245	0.245	0.245
Sorbitan fatty acid ester(3)			0.1	0.5			0.2
Sorbitan fatty acid ester(4)						0.2	
Polyglycerol fatty acid ester(5)					0.5		
Sucrose fatty							0.2

acid ester[6]							
(Total)		100	100	100	100	100	100

Lecithin[1]: trade name "Lecithin FA" (crude soybean oil), made by J-Oil Mills, Inc.
Monoglycerol fatty acid ester[2]: trade name "Emulsy-HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester[3]: trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester[4]: trade name "S-65V" (HLB: 3.0), made by Riken Vitamin Co., Ltd.
Polyglycerol fatty acid ester[5]: trade name "HB-750" (HLB: 4.2), made by Sakamoto Yakuhin Kogyo Co., Ltd.
Sucrose fatty acid ester[6]: trade name "ER-290" (HLB: 2.0), made by Mitsubishi Chemical Corp.

[0146]

Additionally, a cookie dough and cookies were prepared using the blend shown in table 7.

[0147]

[Table 7]

[Table 7] (Cookie dough)

Raw material	Blending amount (g)
Plastic oil-and-fat composition according to any one of preparation examples 9 to 14	300
Caster sugar	200
Table salt	2.5
Whole eggs	50
Cake flour	500
Baking powder	5
(Total)	1057.5

[0148]

Table 8 shows the results of evaluation according to (5. Hardness of plastic oil-and-fat composition), (7. Hardness of cookie dough), and (8. Evaluation method) above, together with the blends of the plastic oil-and-fat compositions shown in table 6.

[0149]

[Table 8]

[Table 8] (Plastic oil-and-fat compositions)

		Example 1 (redisplayed)	Comparative example 3	Example 5	Example 6	Example 7	Example 8	Example 9
		Preparation example 5	Preparation example 9	Preparation example 10	Preparation example 11	Preparation example 12	Preparation example 13	Preparation example 14
		With inter-esterified oil	With inter-esterified oil	With inter-esterified oil	With inter-esterified oil	With inter-esterified oil	With inter-esterified oil	With inter-esterified oil
Raw material of plastic oil-and-fat composition (blend: parts by mass)	Feature of raw material							
Oil and fat	Oil phase	83.395	83.595	83.495	83.095	83.095	83.395	83.195
Water	Aqueous phase	16	16	16	16	16	16	16
Lecithin(1)	Emulsi-fier	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Monoglycerol fatty acid ester(2)		0.245	0.245	0.245	0.245	0.245	0.245	0.245
Sorbitan fatty acid ester(3)		0.2		0.1	0.5			
Sorbitan fatty acid ester(4)							0.2	

Polyglycerol fatty acid ester[5]						0.5		
Sucrose fatty acid ester[6]								0.2
(Total)		100	100	100	100	100	100	
Hardness of plastic oil-and-fat composition (N)		0.51	0.54	0.48	0.56	0.72	0.44	0.52
Hardness of cookie dough (N)		23.68	25.49	38.64	32.87	32.43	25.08	26.64
Resilience of cookie dough		4	2	4	4	4	4	4
Stickiness of cookie dough		4	2	3	3	3	4	4
Cuttability of cookie dough		4	2	4	4	3	3	4
Crunchiness of cookies		4	2	4	3	4	4	4
Hardness of cookies		4	3	4	4	3	4	3

Lecithin[1]: trade name "Lecithin FA" (crude soybean oil), made by J-Oil Mills, Inc.
Monoglycerol fatty acid ester[2]: trade name "Emulsy-HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester[3]: trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester[4]: trade name "S-65V" (HLB: 3.0), made by Riken Vitamin Co., Ltd.
Polyglycerol fatty acid ester[5]: trade name "HB-750" (HLB: 4.2), made by Sakamoto Yakuhin Kogyo Co., Ltd.
Sucrose fatty acid ester[6]: trade name "ER-290" (HLB: 2.0), made by Mitsubishi Chemical Corp.

[0150]

As shown in table 8, the following matters were clarified.

[0151]

(1) As observed in the results of comparative example 3, the effect of improving cookie dough and cookies that was observed with the plastic oil-and-fat compositions in which beef fat was blended was not able to be reproduced when no sorbitan fatty acid ester was blended as an emulsifier with the plastic oil-and-fat composition (in which no beef fat was blended) (example 1) of preparation example 5, which obtained a satisfactory evaluation in test example 3.

(2) As observed in the results of example 5 and example 6, the effect of improving cookie dough and cookies that was observed with the plastic oil-and-fat compositions in which beef fat was blended was able to be reproduced even when the amount of the sorbitan fatty acid ester blended as an emsulsifier was half or 2.5 times that in the plastic oil-and-fat composition (in which no beef fat was blended) (example 1) of preparation example 5, which obtained a satisfactory evaluation in test example 3.

(3) As observed in the results of example 7 and example 8, the effect of improving cookie dough and cookies that was observed with the plastic oil-and-fat compositions in which beef fat was blended was able to be reproduced even when a polyglycerol fatty acid ester was blended in lieu of the

sorbitan fatty acid ester blended as an emsulsifier, or when another product was blended as the sorbitan fatty acid ester, in the plastic oil-and-fat composition (in which no beef fat was blended) (example 1) of preparation example 5, which obtained a satisfactory evaluation in test example 3.

(4) As observed in the results of example 9, the effect of improving cookie dough and cookies that was observed with the plastic oil-and-fat compositions in which beef fat was blended was able to be reproduced even when a sucrose fatty acid ester was blended in addition to the sorbitan fatty acid ester blended as an emsulsifier in the plastic oil-and-fat composition (in which no beef fat was blended) (example 1) of preparation example 5, which obtained a satisfactory evaluation in test example 3.

[0152]

[Test example 5]

An evaluation was conducted in which the blending amount of the plastic oil-and-fat composition (in which no beef fat was blended) (example 1) of preparation example 5, which obtained a satisfactory evaluation in test example 3, with respect to the cookie dough was increased/reduced.

[0153]

Specifically, a cookie dough and cookies were prepared using the blend shown in table 9.

[0154]

[Table 9]

[Table 9] (Cookie dough)

Raw material	Blending amount in increased-amount version (g)	Blending amount in reduced-amount version (g)
Plastic oil-and-fat composition according to preparation example 5	350	200
Caster sugar	200	200
Table salt	2.5	2.5
Whole eggs	50	50
Cake flour	500	500
Baking powder	5	5
(Total)	1107.5	957.5

[0155]

Table 10 shows the results of evaluation according to (5. Hardness of plastic oil-and-fat composition), (7. Hardness of cookie dough), and (8. Evaluation method) above.

[0156]

[Table 10]

[Table 10] (Evaluation results)

	Example 1 (redisplayed)	Example 10	Example 11
	Preparation example 5	Preparation example 5	Preparation example 5
	With interesterified oil	With interesterified oil	With interesterified oil
	—	Increased-amount version	Reduced-amount version
Hardness of plastic oil-and-fat composition (N)	0.51	0.51	0.51
Hardness of cookie dough (N)	23.68	21.94	27.50
Resilience of cookie dough	4	3	3
Stickiness of cookie dough	4	4	3
Cuttability of cookie dough	4	4	4
Crunchiness of cookies	4	4	3
Hardness of cookies	4	3	3

Lecithin(1): trade name "Lecithin FA" (crude soybean lecithin), made by J-Oil Mills, Inc.
Monoglycerol fatty acid ester(2): trade name "Emulsy-HRO" (HLB: 4.3), made by Riken Vitamin Co., Ltd.
Sorbitan fatty acid ester(3): trade name "S-320YN" (HLB: 4.2), made by Riken Vitamin Co., Ltd.

[0157]

As shown in table 10, the effect of improving cookie dough and cookies that was observed with the plastic oil-and-fat compositions in which beef fat was blended was able to be reproduced overall even when the blending amount of the

plastic oil-and-fat composition (in which no beef fat was blended) (example 1) of preparation example 5, which obtained a satisfactory evaluation in test example 3, with respect to the cookie dough was increased to 350 g/500 g cake flour or reduced to 200 g/500 g cake flour from 300 g/500 g cake flour.

[0158]

[Test example 6]

An evaluation was conducted in which langue du chat cookies were created using the plastic oil-and-fat composition (in which no beef fat was blended) (example 1) of preparation example 5, which obtained a satisfactory evaluation in test example 3, and the plastic oil-and-fat composition (in which beef fat was blended) (reference example 1) of preparation example 1.

[0159]

<Production of langue du chat cookies>

380 g of caster sugar and 1.6 g of table salt was added to 400 g of oil-and-fat compositions for baked confectionery, and the resulting combination was stirred at low speed for 30 seconds and at intermediate speed for 3 minutes using a 5-quart Hobart mixer (mixer N50 made by Hobart Japan KK) before being scraped down and furthermore stirred at intermediate speed for 2 minutes. 320 g of egg whites was added in four batches to the resulting creamed substance, 88 g of a plant-based cream was next introduced in five batches under stirring at intermediate speed for 1 minute, and the resulting

combination was scraped down and furthermore stirred at low speed for 30 seconds. A sieved powder (400 g of cake flour, 80 g of almond powder) was subsequently added, and the resulting combination was stirred at low speed for 30 seconds to obtain a dough for langue du chat cookies.

[0160]

Furthermore, the resulting dough was imprinted by a die and baked for approximately 14 minutes in an oven (Camel, made by Tokyo Kotobuki Industry KK) at a baking temperature of 160°C (upper portion of oven)/160°C (lower portion of oven) to produce langue du chat cookies.

[0161]

<Evaluation of langue du chat cookies>

The unbaked langue du chat cookie dough obtained by blending the plastic oil-and-fat composition of preparation example 5 exhibited a proper level of resilience and stickiness as well as exceptional cuttability on the same level as the dough blended with beef-fat-containing preparation example 1 despite no beef fat being used therein. Furthermore, the hardness and crunchiness of the baked langue du chat cookies blended with preparation example 5 were agreeable on the same level as the cookies blended with beef-fat-containing preparation example 1.