[DESCRIPTION]

[TITLE OF INVENTION]

ROLL-IN OIL AND FAT COMPOSITION

[Technical Field]

[0001]

The present invention relates to a roll-in oil and fat composition having excellent spreadability in a wide temperature range and layered bakery food which is produced using the roll-in oil and fat composition and has a juicy texture and a good crispy texture.

[Background Art]

[0002]

In a case of producing layered bakery foods such as pies or Danish pastries, a roll-in oil and fat composition is folded into dough in a layer shape in order to form a layered structure. Thereafter, the layered dough is baked to produce layered bakery food having good unique crispiness and a crunchy feeling. Such a roll-in oil and fat composition is required to have spreadability in a wide temperature range of, for example, 5°C to 25°C, when being folded into dough and have excellent crispiness and a melt-in-the-mouth feeling after being baked.

[0003]

In response to the above-described requirements, a roll-in oil and fat composition that has spreadability and excellent crispiness and a melt-in-the-mouth feeling after being baked has been obtained in the related art by formulating hydrogenated oils of animal and vegetable oils and fats as high-melting-point oils and fats or medium-melting-point oils and fats with a roll-in oil and fat composition together with liquid oils and fats.

[0004]

Patent Literature 5 relates to an oil and fat composition for a layered food which has a specific triglyceride composition and contains a milk fat-fractionated low-melting-point portion, transesterified oils including an oil mixture of lauric oils and fats and palm oils and fats, transesterified oils including palm oils and fats, and liquid oils. A juicy texture derived from milk fat is exhibited by formulating a milk fat-fractionated low-melting-point portion with vegetable oils and fats having a relatively good melt-in-the-mouth feeling. However, there are problems in that the milk fat-fractionated low-melting-point portion is relatively expensive and production becomes complicated since a fractionation step is required. In addition, the juicy feeling according to the Patent Literature 5 is also a texture felt when oils and fats ooze from bakery foods when biting the bakery foods with the teeth even though there is no oily feeling at the moment when the bakery foods are put into the mouth, and is therefore different from a juicy feeling of fresh-baked layered bakery products. Furthermore, since the palm oils and fats are main components, the chewy texture of the oil and fat composition for a layered food tends to become slightly low.

[Citation List]

[Patent Literature]

[0014]

Patent Literature 1: Japanese Re-Publication of PCT Application No. 2006/11331

Patent Literature 2: Japanese Patent Laid-Open No. 2012-183080

Patent Literature 3: Japanese Re-Publication of PCT Application No. 2013/153902

Patent Literature 4: Japanese Patent Laid-Open No. 2013-188205

Patent Literature 5: Japanese Patent Laid-Open No. 2016-82887

[Summary of Invention]

[Technical Problem]

[0015]

The present invention addresses the problem of providing: a roll-in oil and fat composition which is of a low-trans type with a trans fatty acid content of less than 5% by weight, has a high chewy texture, has excellent spreadability in a wide temperature range, and has an excellent melt-in-the-mouth feeling; and layered bakery food which can be produced using the roll-in oil and fat composition and has substantially a fresh-baked juicy texture and crispiness even one day after being baked.

[Solution to Problem]

[0016]

As described above, in the methods proposed in the related art, it is impossible to obtain a low-trans type roll-in oil and fat composition which has all of the characteristics of strength of a chewy texture during preparation of layered bakery dough of a roll-in oil and fat composition, spreadability in a wide temperature range, and substantially a fresh-baked juicy texture even one day after being baked.

[0017]

The present inventors have conducted extensive studies on roll-in oil and fat compositions in order to solve the above-described problems. As a result, they have found that a roll-in oil and fat composition, which includes specific proportions of liquid oils and random transesterified oils including specific proportions of lauric acid, palmitic acid, and stearic acid in the total constituent fatty acid composition, has an excellent chewy texture and spreadability, and a layered bakery baked using the roll-in oil and fat composition have substantially a fresh-baked

of a juicy feeling to the layered bakery food produced using the roll-in oil and fat composition one day after being baked is also inhibited.

[0021]

The lauric acid content in the transesterified oils and fats is more preferably 10 to 20% by weight, and the palmitic acid content is more preferably 5 to 20% by weight. In addition, the stearic acid content is more preferably 15 to 35% by weight. The St/P ratio is more preferably 0.8 to 5 and most preferably 1 to 3.

[0022]

In a case where the above-described lauric acid content is less than 5% by weight, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to decrease and the melt-in-the-mouth feeling of a layered bakery product as a final product also tends to become heavy. On the other hand, in a case where the lauric acid content exceeds 25% by weight, the roll-in oil and fat composition tends to become hard at low temperature, and there is a tendency that the chewy texture of the roll-in oil and fat composition becomes low and the spreadability in a wide temperature range of, for example, 5°C to 25°C, deteriorates, which is not preferable.

[0023]

In a case where the above-described palmitic acid content is less than 5% by weight, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to decrease as expected and the melt-in-the-mouth feeling of a layered bakery product as a final product also tends to become heavy. On the other hand, in a case where the palmitic acid content exceeds 25% by weight, the roll-in oil and fat composition tends to become slightly hard at low temperature, and there is a tendency that the chewy texture of the roll-in oil and fat composition becomes low and the spreadability in a wide temperature range of, for example, 5°C to 25°C, deteriorates.

[0024]

In a case where the above-described stearic acid content is less than 10% by weight, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to improve. However, the roll-in oil and fat composition tends to become hard at low temperature, the chewy texture of the roll-in oil and fat composition becomes low, and the spreadability in a wide temperature range of, for example, 5°C to 25°C, deteriorates, which is not preferable. On the other hand, in a case where the stearic acid content exceeds 35% by weight, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to decrease as expected and the melt-in-the-mouth feeling of a layered bakery product as a final product also tends to become heavy.

[0025]

In a case where the above-described stearic acid-to-palmitic acid weight ratio is less than 0.5, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to improve. However, the roll-in oil and fat composition tends to become hard at low temperature, the chewy texture of the roll-in oil and fat composition becomes low, and the spreadability in a wide temperature range of, for example, 5°C to 25°C, deteriorates, which is not preferable. On the other hand, in a case where the stearic acid-to-palmitic acid weight ratio exceeds 7, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to decrease as expected and the melt-in-the-mouth feeling of a layered bakery product as a final product also tends to become heavy.

[0026]

The liquid oils used in the roll-in oil and fat composition of the present invention are not particularly limited as long as these are oils and fats exhibiting a liquid state at temperatures between refrigeration temperature and room temperature, and one kind or

two or more kinds selected from rapeseed oil, soybean oil, corn oil, sunflower oil, rice bran oil, cottonseed oil, safflower oil, palm super olein, and the like can be used.

[0027]

It is preferable that the content of the high-melting-point oils and fats having a rising melting point of higher than 45°C in the roll-in oil and fat composition of the present invention be less than 1% by weight or that no high-melting-point oils and fats be contained therein at all. The high-melting-point oils and fats having a rising melting point of higher than 45°C are one kind or two or more kinds of oils and fats which have a rising melting point of higher than 45°C and are selected from various vegetable oils and fats and animal oils and fats such as lauric oils and fats, palm oils and fats, corn oil, cottonseed oil, soybean oil, rapeseed oil, rice oil, sunflower oil, safflower oil, beef tallow, milk fat, lard, cacao butter, fish oil, and whale oil, and fractionated oils, transesterified oils and fats, and hydrogenated oils and fats of these oils and fats.

[0028]

The roll-in oil and fat composition of the present invention preferably has a rising melting point of 30°C to 40°C, an SFC of 20% to 45% at 20°C, and an SFC of less than or equal to 10% at 35°C. The rising melting point is more preferably 32°C to 38°C. In addition, the SFC is more preferably 25% to 40% at 20°C and less than or equal to 9% at 35°C.

[0029]

In a case where the rising melting point is lower than 30°C, the spreadability in a temperature range of 20°C to 25°C tends to deteriorate. In a case where the rising melting point is higher than 40°C, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to decrease and the melt-in-the-mouth feeling of a layered bakery product as a final product also tends to become heavy. In addition, in a case where the SFC at 20°C

is less than 20%, the spreadability in a temperature range of 20°C to 25°C tends to deteriorate. In a case where the SFC at 20°C exceeds 45%, the spreadability at a low temperature of 5°C to 10°C tends to deteriorate. In a case where the SFC at 35°C exceeds 10%, the melt-in-the-mouth feeling of the roll-in oil and fat composition tends to decrease and the melt-in-the-mouth feeling of a layered bakery product as a final product also tends to become heavy.

[0030]

The transesterified oils and fats of the present invention can be obtained, for example, by being formulated with the following oil and fat raw materials and then performing transesterification. 10 to 50% by weight of lauric oils and fats as a lauric acid source, 0 to 75% by weight of palm oils and fats as a palmitic acid source, 10 to 30% by weight of extremely hardened oils of liquid oils and fats or natural fats and oils rich in stearic acid as a stearic acid source, and an appropriate amount of liquid oils and fats rich in unsaturated fatty acids or oils and fats rich in saturated fatty acids having 20 to 24 carbon atoms as necessary for adjusting the rising melting point and the SFC of the transesterified oils and fats may be mixed with each other and used for transesterification.

[0031]

One kind or two or more kinds selected from coconut oil, palm kernel oil, and babassu oil, and fractionated oils, hydrogenated oils, and transesterified oils thereof can be used as the lauric oils and fats, and extremely hardened oils are preferable in the case of hydrogenated oils.

[0032]

One kind or two or more kinds selected from palm oils and fractionated palm oils such as palm olein, super palm olein, a palm medium-melting-point portion, and

[0051]

(Preparation of Roll-in Oil and fat composition)

Example 1

Melted oils of 82 parts of the oils and fats 1 prepared in Trial Production Example 1 and 18 parts of rapeseed oil were mixed with each other, and 0.48 parts of stearic acid monoglyceride (trade name: Emulsy P100 manufactured by RIKEN VITAMIN CO., LTD.) and 0.12 parts of lecithin were added thereto to prepare an oily phase. 1.0 parts of table salt was added to 16 parts of water to prepare an aqueous phase. 83 parts of the oily phase and 17 parts of the aqueous phase were mixed with each other and stirred at 60°C to be preliminarily emulsified, and rapidly cooled and kneaded with a combinator to obtain a roll-in oil and fat composition 1 having a favorable structure. The rising melting point of the oily phase was 36.0°C.

[0052]

Example 2

A roll-in oil and fat composition was prepared in the same manner as in Example 1 by replacing 82 parts of the oils and fats 1 in Example 1 with 82 parts of the oils and fats 2 prepared in Trial Production Example 2 to obtain a roll-in oil and fat composition 2. The rising melting point of the oily phase was 34.2°C.

[0053]

Example 3

A roll-in oil and fat composition was prepared in the same manner as in Example 1 by replacing 82 parts of the oils and fats 1 in Example 1 with 82 parts of the oils and fats 3 prepared in Trial Production Example 3 to obtain a roll-in oil and fat composition 3. The rising melting point of the oily phase was 31.2°C.

[0054]

Comparative Example 1

A roll-in oil and fat composition was prepared in the same manner as in Example 1 by replacing 82 parts of the oils and fats 1 in Example 1 with 82 parts of the oils and fats 4 prepared in Trial Production Example 4 to obtain a roll-in oil and fat composition 4. The rising melting point of the oily phase was 32.2°C.

[0055]

Comparative Example 2

A roll-in oil and fat composition was prepared in the same manner as in Example 1 by replacing 82 parts of the oils and fats 1 in Example 1 with 82 parts of the oils and fats 5 prepared in Trial Production Example 5 to obtain a roll-in oil and fat composition 5. The rising melting point of the oily phase was 32.1°C.

[0056]

Comparative Example 3

Melted oils of 70 parts of the oils and fats 1 prepared in Trial Production Example 1, 20 parts of the oils and fats 6 prepared in Trial Production Example 6, and 10 parts of rapeseed oil were mixed with each other, and 0.48 parts of stearic acid monoglyceride (trade name: Emulsy P100 manufactured by RIKEN VITAMIN CO., LTD.) and 0.12 parts of lecithin were added thereto to prepare an oily phase. 1.0 parts of table salt was added to 16 parts of water to prepare an aqueous phase. 83 parts of the oily phase and 17 parts of the aqueous phase were mixed with each other and stirred at 60°C to be preliminarily emulsified, and rapidly cooled and kneaded with a combinator to obtain a roll-in oil and fat composition 6 having a favorable structure. The rising melting point of the oily phase was 37.3°C.

[0057]

Comparative Example 4

Melted oils of 80 parts of the oils and fats 1 prepared in Trial Production Example 1, 2 parts of extremely hardened high erucic acid rapeseed oil, and 18 parts of rapeseed oil were mixed with each other, and 0.48 parts of stearic acid monoglyceride (trade name: Emulsy P100 manufactured by RIKEN VITAMIN CO., LTD.) and 0.12 parts of lecithin were added thereto to prepare an oily phase. 1.0 parts of table salt was added to 16 parts of water to prepare an aqueous phase. 83 parts of the oily phase and 17 parts of the aqueous phase were mixed with each other and stirred at 60°C to be preliminarily emulsified, and rapidly cooled and kneaded with a combinator to obtain a roll-in oil and fat composition 7 having a favorable structure. The rising melting point of the oily phase was 40.5°C.

[0058]

Results of analyzing the oily phases of the roll-in oil and fat compositions prepared in Examples 1 to 3 and Comparative Examples 1 to 4 are shown in Table 2.

[0059]

(Preparation of Layered Bakery Food)

Croissants were prepared with the following formulation using the roll-in oil and fat compositions 1 to 7 prepared in Examples 1 to 3 and Comparative Examples 1 to 4.

Formulation of Croissant Dough

Hard flour: 100 parts by weight

White superior soft sugar: 8 parts by weight

Table salt: 1.6 parts by weight

Powdered skim milk: 3 parts by weight

Whole egg: 10 parts by weight

Malt syrup: 0.5 parts by weight

Kneaded oils and fats: 6 parts by weight

Yeast: 3 parts by weight

Yeast food: 0.1 parts by weight

Water: 50 parts by weight

50 parts by weight of each roll-in oil and fat composition were used based on the hard flour.

[0060]

Examples 4 to 6 and Comparative Examples 5 to 8

The above-described croissant dough raw materials were kneaded and fermented in a chamber for 60 minutes at a humidity of 75% at 28°C, and were then retarded for 60 minutes in a freezer at -18°C. Each of the roll-in oil and fat compositions of Examples 5 to 8 and Comparative Examples 3 and 4 was wrapped in dough and folded (50% based on flour), and three-folding was performed twice with a reversible sheeter. Thereafter, the roll-in oil and fat compositions were retarded for 60 minutes in a freezer at -7°C, and three-folding

was performed once with the reversible sheeter. Then, the roll-in oil and fat compositions were retarded for 45 minutes in the freezer at -7°C. Subsequently, the retarded dough was finally spread with the reversible sheeter to a thickness of 4 mm and molded. After the molding, the dough pieces were fermented in a chamber for 60 minutes at a humidity of 75% at 32°C, and were then baked in an oven for 16 minutes at a temperature of 210°C in the chamber to obtain croissants 1 to 7.

[0061]

(Evaluation of Chewy Texture and Spreadability of Roll-in Oil and fat composition)

Each of the roll-in oil and fat compositions of which the temperature was controlled in a constant temperature chamber at 10°C and 20°C was wrapped in dough and folded (50% based on flour), and three-folding was performed twice with a reversible sheeter. The spreadability of the roll-in oil and fat compositions was evaluated according to the following criteria. In addition, the chewy texture of the roll-in oil and fat compositions was evaluated according to the following criteria from the dough state during final spreading. The evaluation results are shown in Table 3. A score of O or higher was considered to be acceptable.

(Evaluation of Roll-in (Spreadability) When Temperature is Controlled at 10°C)

⊙: A roll-in oil and fat composition cleanly extends to ends of dough without any cracks.

O: Although there is no crack in a roll-in oil and fat composition, dough remains at the end.

Δ: There are slight cracks in a roll-in oil and fat composition, and dough remains at the end.

×: Roll-in oils and fats are cracked and hardly extend.

and stirred at 60°C to be preliminarily emulsified, and rapidly cooled and kneaded with a combinator to obtain a roll-in oil and fat composition 13 having a favorable structure. The rising melting point of the oily phase was 33.8°C.

[0071]

Comparative Example 11

Melted oils of 23 parts of the oils and fats 1 prepared in Trial Production Example 1, 35 parts of the oils and fats 4 prepared in Trial Production Example 4, 7 parts of the oils and fats 6 prepared in Trial Production Example 6, 15 parts of rapeseed oil, and 20 parts of butter oil were mixed with each other, and 0.48 parts of stearic acid monoglyceride (trade name: Emulsy P100 manufactured by RIKEN VITAMIN CO., LTD.) and 0.12 parts of lecithin were added thereto to prepare an oily phase. 1 part of table salt was added to 10 parts of water to prepare an aqueous phase. 89 parts of the oily phase and 11 parts of the aqueous phase were mixed with each other and stirred at 60°C to be preliminarily emulsified, and rapidly cooled and kneaded with a combinator to obtain a roll-in oil and fat composition 14 having a favorable structure. The rising melting point of the oily phase was 33.9°C.

[0072]

Results of analyzing the oily phases of the roll-in oil and fat compositions prepared in Examples 7 to 10 and Comparative Examples 9 to 11 are shown in Table 4.

[0074]

As shown in Table 5, Examples 7 to 10 in which 55 to 63% by weight of the transesterified oils and fats of the present invention and 11% by weight of rapeseed oil were formulated in an oily phase have favorable spreadability at 10°C to 20°C and an excellent chewy texture. In addition, Examples 11 to 14 baked using the roll-in oil and fat compositions of Examples 7 to 10 have favorable melt-in-the-mouth feeling, juicy feeling, crispiness, and crunchy feeling. Comparative Examples 9 and 10 in which the amount of each of the transesterified oils and fats of the present invention in the oily phase is 30 to 40% by weight have favorable melt-in-the-mouth feeling and juicy feeling, but lack spreadability at 10°C to 20°C and have slightly poor crispiness of the croissants. Comparative Example 11 in which the transesterified oils and fats 6 as high-melting-point oils and fats is formulated with an oil mixture of the transesterified oils and fats 1 of the present invention, the transesterified oils and fats 4 prepared in Trial Production Example 4, and rapeseed oil have favorable spreadability at 10°C to 20°C, and the croissant of Comparative Example 14 baked using the same has favorable crispiness. However, the croissant has a slightly poor melt-in-the-mouth feeling and lacks a juicy feeling.

[Industrial Applicability]

[0075]

According to the present invention, it is possible to provide: a roll-in oil and fat composition which is of a low-trans type with a trans fatty acid content of less than 5% by weight, has a high chewy texture, has excellent spreadability in a wide temperature range, and has an excellent melt-in-the-mouth feeling; and layered bakery food which can be produced using the roll-in oil and fat composition and has substantially a fresh-baked juicy texture and crispiness even one day after being baked.