

DESCRIPTION

Title of Invention: OILY FOOD MATERIAL FOR COATING FROZEN DESSERT

Technical Field

5 [0001]

The present invention relates to chocolates for coating frozen confectionery, wherein the chocolates achieve both physical properties and texture.

10 Background Art

[0002]

Frozen confectionery products, such as ice cream, are often coated with an oil and fat composition or an oily food material (e.g., chocolates) from the standpoint of providing a variety of flavors, preventing moisture migration, or developing texture. When such a coating is made, liquid oils, lauric acid-based oils and fats that have a low melting point and give a sharp mouth melt, or palm oil, for example, are commonly used in consideration of mouth melt, and the use of cocoa butter, which gives poor mouth melt in the freezing temperature range is likely to be limited to a small amount.

In the production process, the solidity rate is also important from the standpoint of impact on subsequent steps and control of the coating weight, and oils and fats that are excellent in solidity need to be added to achieve the solidity rate. These oils and fats, however, may give a hard texture or poor mouth melt, or may even be subject to cracking.

[0003]

Chocolates have been developed that have an increased solidity rate, while maintaining mouth melt, or that have a soft texture when chewed, while achieving excellent solidity.

According to Patent Literature 1, for example, adding a specific amount of POP and lauric acid can provide chocolates for frozen confectionery that achieve a suitably hard chewing texture and excellent mouth melt, but the chocolates are still

unsatisfactory in preventing cracking when used for confectionery coating.

[0004]

Techniques for decreasing cracking have also been
5 developed.

Examples include

a composition in which the triglyceride composition of the oil and fat added contains less than 8% of SSS, 25-80% of SUS, 2-40% of SUU, and 5% or more of UUU (S: a C₁₆₋₂₄ saturated fatty
10 acid, U: an unsaturated fatty acid having 18 or more carbon atoms) (Patent Literature 2);

a chocolate containing 10-85 wt% of di-saturated mono-unsaturated glyceride (S2U) and 15-90 wt% of di-unsaturated mono-saturated glyceride (SU2) and tri-unsaturated glyceride (U3) in
15 total, with 35 wt% or more of di-saturated monilinate (S2L) in di-saturated mono-unsaturated glyceride (S2U) (Patent Literature 3); and

an oily composition contains 5-50 mass% of transesterified oil and fat in a liquid phase, wherein the SFC
20 (solid fat content) of the oil phase is 1-20% at 10°C, 1-15% at 20°C, and 0-6% at 40°C (Patent Literature 4).

These can provide some flexibility and a cracking inhibitory effect, but are instead somewhat unsatisfactory in solidity, with some difficulty in controlling the coating weight.
25 [0005]

A patent application for a chocolate containing 3% or less of X3, 40 to 60% of X2U, 18 to 37% of POP, 31 to 47% of XU2, and 10% or less of U3 (Patent Literature 5), and

a patent application for a chocolate containing 3% or
30 less of X3, 15 to 34% of X2U, 30 to 47% of XU2, 10% or less of U3, 10 to 34% of a saturated fatty acid having 14 or fewer carbon atoms (Patent Literature 6) (X: a C₁₆₋₁₈ saturated fatty acid, U: a C₁₈ unsaturated fatty acid, P: palmitic acid, and O: oleic acid) relate to chocolates for frozen confectionery that have a crunchy
35 texture and that resist cracking.

But the effects are insufficient when the shrinkage of the chocolates severely affects the chocolate coating (e.g., when chocolate covers the entire ice cream).

5 Citation List

Patent Literature

[0006]

Patent Literature 1: JP2006-280209A

Patent Literature 2: JPH10-506285A

10 Patent Literature 3: JPH06-105655A

Patent Literature 4: JP2010-268749A

Patent Literature 5: JP2015-15914A

Patent Literature 6: JP2015-15915A

15 Summary of Invention

Technical Problem

[0007]

An object of the present invention is to provide an oily food material for coating a frozen confectionery wherein the
20 oily food material offers excellence in solidity, control of the coating weight (per area weight), and a cracking inhibitory effect, while maintaining excellent mouth melt.

Solution to Problem

25 [0008]

The present inventors conducted extensive research on the problem, and found that adding a predetermined amount or more of StOO to oil and fat and further adjusting the triglyceride composition so as to fall within a specific range can solve the
30 problem. The inventors then completed the invention.

[0009]

Specifically, the present invention includes the following.

35 Item 1.

An oily food material for coating a frozen confectionery wherein a triglyceride composition of oil and fat satisfies the following conditions (1) to (4):

- (1) StOO is present in an amount of 10 wt% or more;
 - 5 (2) a triglyceride or triglycerides whose constituent fatty acids have 30 to 38 carbon atoms in total are present in an amount of 8 to 30 wt%;
 - (3) POP is present in an amount of 15 wt% or less; and
 - (4) SUS is present in an amount of less than 15 wt%,
10 and/or SUU is present in an amount of less than 30 wt%;
- wherein
- S represents a saturated fatty acid having 16 to 20 carbon atoms,
U represents an unsaturated fatty acid having 16 to 18 carbon atoms,
- 15 St represents stearic acid,
O represents oleic acid, and
P represents palmitic acid.

Item 2.

- 20 The oily food material for coating a frozen confectionery according to Item 1, wherein the POO content in the oil and fat is 20 wt% or less.

Item 3.

- 25 The oily food material for coating a frozen confectionery according to Item 1, wherein the POO content in the oil and fat is 15 wt% or less.

Item 4.

- 30 The oily food material for coating a frozen confectionery according to Item 1, wherein the POP is present in an amount of 10 wt% or less.

Item 5.

- 35 The oily food material for coating a frozen

confectionery according to Item 2, wherein the POP is present in an amount of 10 wt% or less.

Item 6.

5 The oily food material for coating a frozen confectionery according to Item 3, wherein the POP is present in an amount of 10 wt% or less.

Item 7.

10 The oily food material for coating a frozen confectionery according to Item 1, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

15 Item 8.

 The oily food material for coating a frozen confectionery according to Item 2, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

20

Item 9.

 The oily food material for coating a frozen confectionery according to Item 3, wherein the oil and fat content in the oily food material for coating a frozen
25 confectionery is 50 wt% or more.

Item 10.

 The oily food material for coating a frozen confectionery according to Item 4, wherein the oil and fat
30 content in the oily food material for coating a frozen confectionery is 50 wt% or more.

Item 11.

 The oily food material for coating a frozen
35 confectionery according to Item 5, wherein the oil and fat

content in the oily food material for coating a frozen confectionery is 50 wt% or more.

Item 12.

5 The oily food material for coating a frozen confectionery according to Item 6, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

10 Item 13.

 A frozen confectionery coated with the oily food material for coating a frozen confectionery according to Item 1.

Item 14.

15 A frozen confectionery coated with the oily food material for coating a frozen confectionery according to Item 11.

Item 15.

20 A frozen confectionery coated with the oily food material for coating a frozen confectionery according to Item 12.

In other words, the invention includes the following.

Item 16.

25 An oily food material for coating a frozen confectionery, wherein a triglyceride composition of oil and fat satisfies the following conditions (1) to (4):

 (1) StOO is present in an amount of 10 wt% or more;

 (2) a triglyceride or triglycerides whose constituent
30 fatty acids have 30 to 38 carbon atoms in total are present in an amount of 8 to 30 wt%;

 (3) POP is present in an amount of 15 wt% or less; and

 (4) SUS is present in an amount of less than 15 wt%,
and/or SUU is present in an amount of less than 30 wt%.

35 In the oily food material,

S represents a saturated fatty acid having 16 to 20 carbon atoms,
U represents an unsaturated fatty acid having 16 to 18 carbon
atoms,

St represents stearic acid,

5 O represents oleic acid, and

P represents palmitic acid.

Item 17.

The oily food material for coating a frozen
10 confectionery according to Item 16, wherein the POO content in
the oil and fat is 20 wt% or less.

Item 18.

A frozen confectionery coated with the oily food
15 material for coating a frozen confectionery according to Item 16
or 17.

Advantageous Effects of Invention

[0010]

20 The present invention can provide chocolates that are
excellent in workability in the production process and that are
excellent in mouth melt, and can also provide frozen
confectionery using the chocolates.

In addition, because the cracking due to shrinkage is
25 also reduced, the product quality can be maintained, in
particular, in the form of full coating.

Description of Embodiments

[0011]

30 The following describes the present invention in detail.

[0012]

The oily food material for coating a frozen
confectionery according to the present invention is a food
product in which oil and fat form a continuous phase, and
35 particularly refers to chocolates for coating the entire surface

or part of the surface of a frozen confectionery.

The chocolates as used here are not subject to regulations of codes ("the Fair Competition Code for Labeling of Chocolate") and laws, and include chocolates and oil-and-fat
5 processed foods, both using animal or vegetable oils and fats, other than cocoa butter, and also include chocolate products.

The chocolates are prepared by suitably mixing starting materials, such as cocoa mass, cocoa butter, cocoa, edible oils and fats, sugar, milk powder, emulsifiers, and flavoring,
10 following an ordinary method.
[0013]

The type of frozen confectionery according to the present invention is not particularly limited, as long as the frozen confectionery at a freezing temperature is eaten.

15 Typical examples include ice cream, ice milk, and lacto-ice prescribed in the "Ministerial Ordinance Concerning Compositional Standards, etc., for Milk and Milk Products" ("Ministerial Ordinance Concerning Milk, etc."), and ice confections prescribed in the announcement of the Ministry of
20 Health, Labour and Welfare "Specifications and Standards for Foods, Food Additives, etc."
[0014]

A feature of the oily food material according to the present invention is that the triglyceride composition of the
25 contained oil and fat satisfies all of the following conditions.

The oil and fat as used here include, in addition to a variety of animal or vegetable oil-and-fat starting materials to be added, cocoa butter, cocoa mass, cocoa, milk powder, and oils and fats derived from formulations thereof.

- 30 (1) StOO is present in an amount of 10 wt% or more;
(2) a triglyceride or triglycerides whose constituent fatty acids have 30 to 38 carbon atoms in total are present in an amount of 10 to 25 wt%;
(3) POP is present in an amount of 15 wt% or less; and
35 (4) SUS is present in an amount of less than 15 wt%,

and/or SUU is present in an amount of less than 30 wt%;

In the oily food material,

S represents a saturated fatty acid having 16 to 20 carbon atoms,

U represents an unsaturated fatty acid having 16 to 18 carbon

5 atoms,

St represents stearic acid,

O represents oleic acid, and

P represents palmitic acid.

[0015]

10 The following describes each item in more detail.

[0016]

StOO

Adding StOO (a triglyceride in which fatty acids at positions 1 and 2 are O, with a fatty acid at position 3 being St, or a triglyceride in which fatty acids at positions 2 and 3 are O, with a fatty acid at position 1 being St) in an amount of 10 wt% or more, preferably 15 wt% or more, provides both suitable dryness and resistance to cracking, and also provides excellent mouth melt.

20 The upper limit of the amount of StOO is not particularly limited, but is preferably about 50 wt%, taking into consideration, for example, a balance with other physical properties.

Examples of major starting materials containing StOO include, not only a singular form of oils and fats obtained by processing fat and oil, such as shea fat, sal fat, illipe fat, mango fat, safflower oil, sunflower oil, soybean oil, or rapeseed oil through, for example, enzymatic transesterification or fractionation, but also include mixtures thereof.

30 [0017]

Total Number of Carbon Atoms

A triglyceride in which the constituent fatty acids have 30 to 38 carbons in total (i.e., the total number is C30, C32, C34, C36, or C38) is added in an amount of 8 to 30 wt%, and preferably 10 to 25 wt%.

This can achieve both suitable solidity (drying speed) in the step of coating a frozen confectionery and resistance to cracking.

The total number of carbon atoms of the constituent
5 fatty acids here refers to the total number of carbons determined by deducting three carbon atoms of glycerin from the total number of carbons constituting one triglyceride molecule.

[0018]

POP

10 POP (a triglyceride in which fatty acids at positions 1 and 3 are P, and a fatty acid at position 2 is O) is added in an amount of 15 wt% or less, and more preferably 10 wt% or less.

An amount of POP in excess of this leads to easily breakable chocolates, a hard texture, and possibly poor mouth
15 melt.

[0019]

SUS, SUU

SUS (2-unsaturated, 1,3-di-saturated glyceride) and SUU (1- or 3-saturated, di-unsaturated glyceride) are added to
20 satisfy either of the following conditions: the content of SUS is less than 15 wt% or SUU is less than 30 wt%, or to satisfy both conditions. If both conditions are not satisfied, the resistance to cracking or mouth melt may deteriorate.

[0020]

25 POO

It is preferable to add POO (a triglyceride in which fatty acids at positions 1 and 2 are O, with a fatty acid at position 3 being P, or a triglyceride in which fatty acids at positions 2 and 3 are O, with a fatty acid at position 1 being P)
30 in an amount of 20 wt% or less, and more preferably 15 wt% or less.

POO in excess of this amount may result in decreases in the dryness after coating.

[0021]

35 The oil-and-fat starting materials for use in the oily

food material of the present invention are not particularly limited, as long as the materials have the triglyceride composition described above.

Examples include a variety of vegetable oils and fats,
5 such as soybean oil, cottonseed oil, corn oil, safflower oil, olive oil, palm oil, rapeseed oil, rice bran oil, sesame oil, kapok oil, coconut oil, and palm kernel oil; and processed oils and fats thereof, such as hydrogenated oils, fractionated oils, and transesterified oils. These oils and fats may be used singly
10 or in a combination of two or more.

The oil-and-fat starting materials are added such that the oil and fat content in the oily food material is 40 wt% or more, and preferably 50 wt% or more. An oil and fat content less than this amount may result in difficulty in achieving physical
15 properties suitable for coating.

Examples

[0022]

20 The following describes the present invention in more detail with reference to Examples and Comparative Examples. The "%" and "parts" in the Examples are a weight basis unless indicated otherwise.

[0023]

25 Preparation of Oily Food Material (Chocolates)

Starting materials of the formulations shown in Table 1 were subjected to rolling and conching treatment by an ordinary method, and chocolates were prepared.

The chocolates were adjusted to have a particle size of
30 18 μm and a viscosity of 300 cp (40°C, B-type viscometer, No. 2 rotor, 30 rpm).

The "Vegetable Oil and Fat A" in Table 1 indicates oil and fat having an StOO content of about 40%. The starting materials for use were low-melting-point fractions of oil and fat
35 obtained by subjecting Hi-oleic sunflower oil and stearic acid to

transesterification with a 1,3 position selective lipase.

[0024]

Ice Cream Coating Test

Chocolates were melted with heating to adjust the
5 temperature to 40°C, and subjected to a coating test using a
commercially available ice cream bar (room temperature 20°C).

The evaluation items and criteria are described below.
A chocolate that is given ◎ or ○ in all items was determined to
pass the evaluation.

10 [0025]

Dropping Finish

As an index for the solidity rate, the time period
(seconds) from when an ice cream bar was entirely dipped in
chocolate and lifted back up to when the chocolate stopped
15 dropping off from the surface of the ice cream bar was measured.

◎: less than 10 seconds

○: 10 seconds or more and less than 12 seconds

△: 12 seconds or more and less than 15 seconds

×: 15 seconds or more

20 [0026]

Dryness

As an index for the solidity rate, the time period
(seconds) from when an ice cream bar was entirely dipped in
chocolate and lifted back up to when the surface solidified and
25 became dry was measured.

◎: less than 12 seconds

○: 12 seconds or more and less than 17 seconds

△: 17 seconds or more and less than 20 seconds

×: 20 seconds or more

30 [0027]

Coating Weight

The weight of the chocolate adhered to the ice cream
bar was measured and compared with a predetermined proper weight
(7 g).

35 ◎: Proper (within ±10%)

○: Slightly larger (+10 to 15%)

△: Slightly smaller (-10 to 15%)

×: Overly large or small (+15% or more, or -15% or less)

[0028]

5 Shrinkage and Cracking

Chocolates were frozen (-20°C) and stored for 7 days, and visually observed to determine whether cracking due to shrinkage occurred.

◎: Practically no cracking was observed

10 ○: Small cracking was observed but at an allowable level

△: Slightly noticeable cracking was observed

×: Noticeable cracking was observed

[0029]

Mouth Melt

15 Chocolates were frozen (-20°C) and stored for 7 days, and a sensory evaluation was performed to examine the mouth melt.

◎: Particularly excellent

○: Excellent

△: Slightly poor

20 ×: Poor

[0030]

Table 1

		Example 1	Example 2	Example 3	Example 4	Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4	Comparative Example 5
Formulation (Part)	Sugar	26	26	26	26	26	26	26	26	26
	Cocoa Mass	8	8	8	8	8	8	8	8	8
	Cocoa	8	8	8	8	8	8	8	8	8
	Vegetable Oil and Fat A	43	43	25	25	—	—	45	36	38
	Purified Coconut Oil	15	10	20	15	10	40	—	5	—
	Palm Superolein	0	—	13	—	48	18	13	5	—
	Cocoa Butter	—	—	—	18	—	—	—	—	20
	Soybean Oil	—	5	—	—	—	—	—	12	—
	Lecithin	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Composition	Oil and Fat Content (%)	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3
Triglyceride Composition of Fat and Oil (%)	StOO	27.4	27.4	16.9	17.4	3.4	1.6	29.4	23.3	25.7
	C30-C38 in Total	17.4	11.6	23.2	17.4	11.6	46.5	0	5.8	0
	POP	3.1	3	3.3	6.5	4.7	2.8	4	3.1	7.4
	SUS	14.8	14.7	14.8	34.6	19.1	11.7	18.3	14.7	39.4
	SUU	35.3	35.2	28.2	23.2	27.7	11.1	44	32.4	33.8
	POO	7.9	7.8	12	5.8	27.1	10.6	15.4	9.4	8.1
Evaluation	Dropping Finish	◎	◎	◎	◎	○	◎	◎	○	◎
	Dryness	○	○	○	○	×	◎	△	△	○
	Coating Weight	◎	◎	◎	○	△	△	○	△	○
	Shrinkage/Cracking	○	◎	○	○	△	×	○	○	△
	Mouth Melt	◎	◎	◎	○	◎	△	◎	○	△

[0031]

Evaluation

As shown in Examples 1 to 4 in Table 1, adding StOO in an amount of 10 wt% or more and oil and fat such that the total amount of C30 to C38 was 8 to 30 wt% achieved a quality rated
5 pass in all items of the evaluation.

When the StOO content was low, the drying was slow (Comparative Example 1). Increasing the content of the total amount of C30-C38 improved dryness, but the excessive amount
10 caused shrinkage and cracking (Comparative Example 2).

Even adding StOO in an amount of 10 wt% or more led to slow drying, when the total amount of C30-C38 was small (Comparative Examples 3, 4, and 5).

CLAIMS

[Claim 1]

An oily food material for coating a frozen
confectionery wherein a triglyceride composition of oil and fat
5 satisfies the following conditions (1) to (4):

(1) StOO is present in an amount of 10 wt% or more;

(2) a triglyceride or triglycerides whose constituent
fatty acids have 30 to 38 carbon atoms in total are present in an
amount of 8 to 30 wt%;

10 (3) POP is present in an amount of 15 wt% or less; and

(4) SUS is present in an amount of less than 15 wt%,
and/or SUU is present in an amount of less than 30 wt%;

wherein

S represents a saturated fatty acid having 16 to 20 carbon atoms,

15 U represents an unsaturated fatty acid having 16 to 18 carbon
atoms,

St represents stearic acid,

O represents oleic acid, and

P represents palmitic acid.

20

[Claim 2]

The oily food material for coating a frozen
confectionery according to claim 1, wherein the POO content in
the oil and fat is 20 wt% or less.

25

[Claim 3]

The oily food material for coating a frozen
confectionery according to claim 1, wherein the POO content in
the oil and fat is 15 wt% or less.

30

[Claim 4]

The oily food material for coating a frozen
confectionery according to claim 1, wherein the POP is present in
an amount of 10 wt% or less.

35

[Claim 5]

The oily food material for coating a frozen confectionery according to claim 2, wherein the POP is present in an amount of 10 wt% or less.

5

[Claim 6]

The oily food material for coating a frozen confectionery according to claim 3, wherein the POP is present in an amount of 10 wt% or less.

10

[Claim 7]

The oily food material for coating a frozen confectionery according to claim 1, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

15

[Claim 8]

The oily food material for coating a frozen confectionery according to claim 2, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

20

[Claim 9]

The oily food material for coating a frozen confectionery according to claim 3, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

25

[Claim 10]

The oily food material for coating a frozen confectionery according to claim 4, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

30

[Claim 11]

35

The oily food material for coating a frozen confectionery according to claim 5, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

5

[Claim 12]

The oily food material for coating a frozen confectionery according to claim 6, wherein the oil and fat content in the oily food material for coating a frozen confectionery is 50 wt% or more.

10

[Claim 13]

A frozen confectionery coated with the oily food material for coating a frozen confectionery according to claim 1.

15

[Claim 14]

A frozen confectionery coated with the oily food material for coating a frozen confectionery according to claim 11.

20

[Claim 15]

A frozen confectionery coated with the oily food material for coating a frozen confectionery according to claim 12.