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(54) Title: NON-HYDROGENATED VEGETABLE FAT COMPOSITION

(57) Abstract: A non-hydrogenated fat composition comprising a liquid oil and a hardstock fat and the preparation process thereof. The liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, and the hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition. Also disclosed is a food product comprising a food ingredient different from a fat, and a non-hydrogenated vegetable fat composition, and a use of a non-hydrogenated vegetable fat composition to reduce oil leakage from a food product.

NON-HYDROGENATED VEGETABLE FAT COMPOSITION

FILED OF THE INVENTION

[0001] The present invention relates to a non-hydrogenated vegetable fat composition comprising a liquid oil and a hardstock fat. The invention further relates to a food product comprising the non-hydrogenated vegetable fat composition.

BACKGROUND

[0002] Fats used in food product applications preferably have good plasticity and heat stability. Special applications, such as margarine and spreads, require additional features like a wide range of operating temperature and fine crystallization. However, for margarines having good plasticity and heat stability, they usually have high slipping melting points (SMP) and saturated fatty acids.

[0003] Margarine and spreads are water-in-oil (W/O) emulsions, which have an aqueous phase dispersed as fine droplets in liquid oil stabilized within a network of solid fat crystals. The lipid phase in margarine is typically a mixture of fats and oils. Fats that are solid at room temperature contain a high percentage of saturated fatty acids, while liquid oils have a high percentage of unsaturated fatty acids. In margarine technology, the composition of the lipid phase is carefully chosen to have a desired ratio of liquid oil and solid fat to obtain a product with desired plasticity and spreadable consistency, as well as good in-mouth melting properties.

[0004] Liquid vegetable oils are preferred over solid fat and animal fat because their unsaturated fatty acids enhance the overall nutritional value. However, margarine is easy to exudate when containing a high quantity of liquid oils.

[0005] Hydrogenation is usually involved in the preparation of fat-containing food products such as margarine; however, hydrogenation leads to formation of trans fatty acids and saturated fatty acids. As advised by renowned health organizations such as the World Health Organization (WHO), intake of saturated fats should be limited as they have been proved to link with cardiovascular diseases. Therefore, hydrogenation has increasingly been considered as an unwanted process that gives unhealthy products and consumer preference is merging clearly to food products that are substantially free of hydrogenated fats.

[0006] EP0151450 discloses a fat blend having a relatively low level of trans fatty acids and the fat blend is obtained by random interesterification of lauric fats, saturated fats, and partially

hydrogenated fats. Hydrogenation is used in preparing the fat blend and artificial trans fatty acids are also present in the fat blend.

[0007] EP1917336 discloses a non-hydrogenated hard stock fat which is obtained by interesterification of palm oil, lauric oil, shea olein, and liquid oil.

[0008] WO2006/131539 discloses a non-hydrogenated vegetable fat composition having an interesterified fat obtained by subjecting a blend of lauric fat and non-lauric fat to an interesterification.

[0009] Thus, there is a need in the food industry to develop vegetable based food products having fat compositions without any hydrogenated components that provide improved plasticity and heat stability to the food products.

SUMMARY

[0010] The present disclosure provides a non-hydrogenated fat composition comprising a liquid oil and a hardstock fat. The liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, and the hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition.

[0011] The present disclosure also provides a method for preparing a non-hydrogenated vegetable fat composition that comprises the step of blending a liquid oil and a hardstock fat.

[0012] The present disclosure also provides a food product comprising a food ingredient different from a fat, and a non-hydrogenated vegetable fat composition.

[0013] The present disclosure further provides a use of a non-hydrogenated vegetable fat composition to reduce oil leakage from a food product. The food product is selected from the group consisting of margarine, shortening, non-dairy topping, non-dairy cream, filling, and spread.

DETAILED DESCRIPTION

[0014] Reference will now be made in detail to certain aspects of the disclosed subject matter. While the disclosed subject matter will be described in conjunction with the enumerated claims, it will be understood that the exemplified subject matter is not intended to limit the claims to the disclosed subject matter.

[0015] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one skilled in the art to which this invention belongs. As used herein, each of the following terms has the meaning associated with it as defined below.

[0016] Unless otherwise indicated, the phrase "suitable for human consumption" means that the composition is generally recognized as safe for eating and drinking and as not being toxic, poisonous, or otherwise harmful to humans when used in functionally useful amounts in solid and liquid food products.

[0017] Unless expressly stated, ppm (parts per million), percentage, and ratios are on a by weight basis. Percentage on a by weight basis is also referred to as wt.% below.

[0018] The term "for example," "for instance," "such as," or "including" as used herein is meant to introduce examples that further clarify more general subject matter. Unless otherwise specified, these examples are provided only as an aid for understanding the applications illustrated in the present disclosure and are not meant to be limiting in any fashion.

[0019] In the methods described herein, the acts can be carried out in any order without departing from the principles of the disclosure, except when a temporal or operational sequence is explicitly recited. Furthermore, specified acts can be carried out concurrently unless explicit claim language recites that they be carried out separately. For example, a claimed act of doing X and a claimed act of doing Y can be conducted simultaneously within a single operation, and the resulting process will fall within the literal scope of the claimed process.

[0020] As used herein, “room temperature” or “RT” refers to a temperature between 20°C to 25°C.

Non-hydrogenated Vegetable Fat Composition

[0021] The present invention relates to a non-hydrogenated vegetable fat composition comprising a liquid oil and a hardstock fat.

[0022] The liquid oil is present in the fat composition an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, 25 to 70 wt.%, or 35 to 45 wt.% based upon total weight of the fat composition.

[0023] The hardstock fat is present in the fat composition an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition.

[0024] The fat composition may also have a triglyceride composition having, based on total weight of the triglycerides, a combined content of C44 to C48 triglycerides in an amount of from 10 to 25 wt.%.

[0025] The fat composition may have a triglyceride composition having, based on total weight of the triglycerides, a content of C54 triglycerides in an amount of from 30 to 50 wt.%.

[0026] The fat composition may have a fatty acid profile having, based on total weight of the fatty acids, a combined content of C12 and C16 fatty acids in an amount of from 25 to 34 wt.%. Preferably, the fat composition may have a fatty acid profile having a ratio of C12 fatty acids to C16 fatty acids from 0.19 to 0.24.

[0027] The fat composition may have a fatty acid profile having, based on total weight of the fatty acids, a content of C18:0 fatty acids in an amount of from 4.2 to 4.4 wt.%, a content of C18:1 fatty acids in an amount of from 24.2 to 25.9 wt.%, a content of C18:2 fatty acids in an amount of from 29.6 to 36.9 wt.%, and a content of C18:3 fatty acids in an amount of from 3.5 to 4.1 wt.%.

[0028] The fat composition may have a fatty acid profile having, based on total weight of the fatty acids, unsaturated fatty acids in an amount of from 55 to 75 wt.%.

[0029] The fat composition comprises no hydrogenated fats.

[0030] The fat composition may have a solid fat content (SFC) that is at least 38 wt.% at 10°C and less than 3 wt.% at 40°C. Solid fat content is measured according to standard methods AOCS Cd 16b-39 or IUPAC 2.150a.

Hardstock fat

[0031] Hardstock fat is an interesterified fat obtained by subjecting to an interesterification a blend of an amount of 25 to 45 wt.%, or 35 to 40 wt.%, of at least one lauric fat, and an amount of 55 to 75 wt.%, or 60 to 65 wt.%, of at least one non-lauric fat based on the weight of the hardstock fat. The interesterification process can be chemical or enzymatic.

[0032] Examples of lauric fat may include, but not be limited to, palm kernel oil, palm kernel stearin, palm kernel olein, coconut oil, coconut stearin, coconut olein, or a blend of two or more thereof. Palm kernel stearin and palm kernel olein may be fractionated from palm kernel oil. Coconut stearin and coconut olein may be fractionated from coconut oil.

[0033] Examples of non-lauric fat may include, but not be limited to, palm oil, soybean oil, rapeseed oil, maize oil, sunflower oil, flaxseed oil, or a blend of two or more thereof.

[0034] The hardstock fat may have a triglyceride composition having, based on total weight of the triglycerides, a combined content of C44 to C48 triglycerides in an amount of from 45 to 50 wt.%.

[0035] The hardstock fat may have a fatty acid profile, based on total weight of the fatty acids, a combined content of C12 and C16 fatty acids in an amount of from 55 to 60 wt.%. Preferably, the combined content of C12 and C16 fatty acids in the fatty acid profile of the hardstock fat is 58.4 wt.% based on total weight of the fatty acids.

[0036] The hardstock fat may have a fatty acid profile having a ratio of C12 fatty acids to C16 fatty acids from 0.3 to 0.5. Preferably, the ratio of C12 fatty acids to C16 fatty acids in the fatty acid profile of the hardstock fat is 0.4.

[0037] The hardstock fat may have a fatty acid profile having, based on total weight of the fatty acids, a content of C18:0 fatty acids in an amount of from 4.0 to 4.2 wt.%, a content of C18:1 fatty acids in an amount of from 22.8 to 23.0 wt.%, a content of C18:2 fatty acids in an amount of from 4.4 to 4.6 wt.%, and a content of C18:3 fatty acids in an amount of from 0.1 to 0.2 wt.%. Preferably, the hardstock fat may have a fatty acid profile having, based on total weight of the fatty acids, a content of C18:0 fatty acids in an amount of 4.1 wt.%, a content of C18:1 fatty acids in an amount of 22.9 wt.%, a content of C18:2 fatty acids in an amount of 4.5 wt.%, and a content of C18:3 fatty acids in an amount of 0.1 wt.%.

[0038] In a preferred aspect of the present invention, the hardstock fat is an interesterified fat obtained by subjecting to a chemical or enzymatic interesterification a blend of an amount of 25 to 45 wt.%, or 35 to 40 wt.%, of at least one lauric fat, and an amount of 55 to 75 wt.%, or 60 to 65 wt.%, of at least one non-lauric fat based on the weight of the hardstock fat. Preferably chemical interesterification is applied. The triglyceride composition of the hardstock fat has, based on total weight of the triglycerides: a combined content of C44 to C48 triglycerides in an amount of from 45 to 50 wt.%; and a combined content of C12 and C16 fatty acids in an amount of from 55 to 60 wt.%. The fatty acid profile of the fat composition has a ratio of C12 to C16 fatty acids from 0.3 to 0.5 and, based on total weight of the fatty acids: a combined content of C12 and C16 fatty acids in an amount of from 55 to 60 wt.%; and a content of C18:0 fatty acids in an amount of from 4.0 to 4.2 wt.%, a content of C18:1 fatty acids in an amount of from 22.8 to

23.0 wt.%, a content of C18:2 fatty acids in an amount of from 4.4 to 4.6 wt.%, and a content of C18:3 fatty acids in an amount of from 0.1 to 0.2 wt.%

Liquid oil

[0039] Liquid oil in the fat composition is a vegetable oil. Preferably, the liquid oil is non-hydrogenated. Examples of liquid oil may include, but not be limited to, soybean oil, sunflower oil, rapeseed oil, high oleic sunflower oil, high oleic rapeseed oil, corn oil, flaxseed oil, or blends of two or more thereof.

[0040] Preferably, the liquid oil has a fatty acid profile having more than 80 wt.% unsaturated fatty acids, based on total weight of the liquid oil.

Food Product

[0041] The present invention also relates to a food product comprising a food ingredient different from a fat, and the non-hydrogenated vegetable fat composition. Examples of the food product may include, but not be limited to, margarine, shortening, non-dairy topping, non-dairy cream, filling, or spread.

[0042] Examples of the food ingredient different from a fat may include, but not be limited to, water, salt, sweetening agents, coloring agents, flavoring agents, preservatives, anti-oxidants, acidity regulator, or combinations thereof.

[0043] Preferably, the food product is a margarine. The margarine may have a slipping melting point (SMP) of less than or equal to 36°C. SMP is measured according to standard methods ISO 6321:2021.

[0044] The margarine may have, based on the total weight of the margarine, the non-hydrogenated vegetable fat composition in an amount of from 70 to 90 wt.%, or from 80 to 85 wt.%, and an aqueous solution in an amount of 10 to 30 wt.%.

[0045] The aqueous solution may include, but not be limited to, water, cow's milk, sheep's milk, goat's milk, soybeans milk, coconut water, almond milk, apple juices, syrup or combinations of two or more thereof. Preferably, the aqueous solution is water.

[0046] The present invention relates to the food product, wherein the margarine has a plasticity of at least 50 g/cm^2.

[0047] The present invention relates to the food product, wherein the margarine has a slipping melting point (SMP) of less than or equal to 36°C.

Use of Non-hydrogenated Vegetable Fat Composition

[0048] The present invention also relates to a use of the non-hydrogenated vegetable fat composition to reduce oil leakage. Examples of the food product may include, but not be limited to, margarine, shortening, non-dairy topping, non-dairy cream, filling, or spread.

[0049] Preferably, there is no oil leakage at 30°C and for at least 5 hours.

[0050] The food product may have a fatty acid profile having, based on total weight of the fatty acids, unsaturated fatty acids in an amount of from 55 to 75 wt.%.

[0051] The food product may have a fatty acid profile having, based on total weight of the fatty acids, poly-unsaturated fatty acids in an amount of from 30 to 55 wt.%.

Process of Preparation of Non-hydrogenated Vegetable Fat Composition

[0052] The non-hydrogenated vegetable fat composition of the present invention can be prepared by blending a liquid oil and a hardstock fat. The liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, based upon total weight of the fat composition. The hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition.

[0053] The fat composition can then be used to prepare a food product, preferably a margarine, by any conventional method for making margarines or other water-in-oil spreads known to a person skilled in the art.

Advantages of the Invention

[0054] As described above, the non-hydrogenated vegetable fat composition of the present invention is a healthy formula with a high percentage of unsaturated fatty acids. The contents of saturated fatty acids and trans fatty acids are low in the non-hydrogenated vegetable fat composition.

[0055] It has surprisingly been found that the non-hydrogenated vegetable fat composition of the present invention has a good plasticity and good heat stability with desired plastic and spreadable

consistency, as well as good in-mouth melting properties. The non-hydrogenated vegetable fat composition of the present invention has also been found to resist heat at high temperature and be not hard at low temperature.

Clauses

1. A non-hydrogenated vegetable fat composition comprising:
    a. a liquid oil; and
    b. a hardstock fat;

    wherein the liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, and the hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition, and
    wherein the fat composition comprises a triglyceride composition comprising, based on total weight of the triglycerides, a content of C54 triglycerides in an amount of from 30 to 50 wt.%.
2. The non-hydrogenated vegetable fat composition according to clause 1, wherein the fat composition comprises a triglyceride composition comprising, based on total weight of the triglycerides, a combined content of C44 to C48 triglycerides in an amount of from 10 to 25 wt.%.
3. A food product comprising a food ingredient different from a fat, and the fat composition according to any one of clause 1 to 2.

4. The food product according to clause 3 wherein the food product is selected from margarine, shortening, non-dairy topping, non-dairy cream, filling and spread.

5. The food product according to clause 3 or 4 wherein the food product is a margarine comprising from 70 wt.% to 90 wt% of the fat composition according to any one of clause 1 to 2.

6. The food product according to clause 5 wherein the margarine is comprising 10 wt% to 30 wt% water.

7. The food product according to any one of clause 3 to 6 wherein the food product is comprising the non-hydrogenated vegetable fat composition and the fat composition is comprising:
    a. a liquid oil; and
    b. a hardstock fat; and

    the liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, and the hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition, and
    the fat composition comprises a triglyceride composition comprising, based on total weight of the triglycerides, a content of C54 triglycerides in an amount of from 30 to 50 wt.%.

8. The food product according to any one of clause 3 to 6 wherein the food product is comprising the non-hydrogenated vegetable fat composition and the fat composition is comprising:
    a. a liquid oil; and
    b. a hardstock fat; and

    the liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, and the hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition, and
    the fat composition comprises a triglyceride composition comprising, based on total weight of the triglycerides, a content of C54 triglycerides in an amount of from 30 to 50 wt.%, and the fat composition comprises a triglyceride composition comprising, based on total weight of the triglycerides, a combined content of C44 to C48 triglycerides in an amount of from 10 to 25 wt.%.

9. The food product according to any one of clause 7 to 8 wherein the food product is a margarine.

10. The food product according to clause 9 wherein the margarine has a plasticity/hardness of at least 50 g/cm^2 at 30°C.

Examples

[0056] The invention is further described in detail by reference to the following experimental examples. These examples are provided for purposes of illustration only and are not intended to be limiting unless otherwise specified. Thus, the invention should in no way be construed as being limited to the following examples, but rather should be construed to encompass any and all variations which become evident as a result of the teaching provided herein.

Analysis methods

Plasticity

[0057] Plasticity is measured by measuring hardness of the fat composition between a temperature range of 5 to 30oC according to in-house method. The hardness is determined with texture analyzer (Type: Stable Micro Systems, Equipment model: TA.XT.PLUS)

[0058] Method:

Prepare 10*10*10cm margarine cubes

Transfer the cubes into thermostatic cabinets separately for 14—16 hours (temperature in a range of 5 to 30°C)

After tempering, record the margarine cube temperature and the hardness with texture analyzer.(temperature in a range of 5 to 30°C)

[0059] A fat composition having a hardness measurement of less than 1000 g/cm^2 at 5°C and greater than 50 g/cm^2 at 30°C would be considered to have a good plasticity.

Heat stability

Heat stability is measured by tempering the fat composition for 5 hours at 30°C. If there is no oil leakage after the tempering, the fat composition would be considered to have a good heat stability. On the other hand, if there is leakage after tempering, the fat composition would be considered not to have a good heat stability.

Solid Fat Content (SFC)

Solid fat content is measured according to standard methods AOCS Cd 16b-39 or IUPAC 2.150a.

Example 1

Hardstock preparation

[0060] The hardstock fats were prepared by interesterification of a lauric and a non-lauric fat, in presence of 0.05 to 0.2% sodium methoxide, at a temperature of 110°C for 30 minutes..

[0061] The further details are provided in Table 1.

Table 1

	Hardstock A	**Hardstock B**	**Hardstock C**
Ingredients	65 wt.% palm oil 35 wt.% lauric fat	80 wt.% palm oil 20 wt.% lauric fat	100% palm oil
Triglyceride composition (wt.%, expressed on total weight of the triglycerides)			
C44 to C48	47	35	10
Fatty acid profile (wt.%, expressed on total weight of the fatty acids)			
C12	16.8	9.8	0.3
C16	41.6	34.0	39
C12 + C16	58.4	43.8	39.3
C12/C16	0.4	0.29	0.007

Fat Composition

[0062] The fat composition was prepared by blending the hardstock with a liquid oil (liquid oil A = soybean oil; liquid oil B = Palm olein).

[0063] Ingredient composition, triglyceride composition, and fatty acid profile, of seven formulations of non-hydrogenated vegetable fat composition are shown in Table 2.

Table 2

Fat Composition	**FC-1**	**FC-2**	**FC-3**	**FC-4**	**FC-5**	**FC-6**	**FC-7**
Ingredients (expressed as a ratio of Hardstock versus Liquid oil)							
Hardstock A	41.56	28.99	33.25	24.93	16.62	--	--
Hardstock B	--	--	--	--	--	41.56	--
Hardstock C	--	--	--	--	--	--	41.56
Liquid oil A	41.56	--	49.87	58.19	66.50	41.56	41.56
Liquid oil B	--	53.83	--	--	--	--	--
Ingredients (expressed as wt% of fat composition)							
Hardstock A	50	35	40	30	20	--	--
Hardstock B	--	--	--	--	--	50	--
Hardstock C	--	--	--	--	--	--	50
Liquid oil A	50	--	60	70	80	50	50
Liquid oil B	--	65	--	--	--	--	--
Triglyceride composition (wt.%, expressed on total weight of the triglycerides)							
C44 to C48	21.7	18.9	17.5	13	10	17.9	6.4
C54	30	8	37	44	53	35	38
Fatty acid profile (wt.%, expressed on total weight of the fatty acids)							
C12	8.4	6.1	6.7	5.0	3.4	4.9	0.2
C16	26.4	40.8	23.3	20.3	17.2	22.6	25.8
C18	4.1	4.2	4	4.0	4	3.9	4.1
C18:1	22.5	35.5	22.4	22.4	22.3	29.5	32.2
C18:2	29.1	8.6	34	38.9	43.8	31.4	32.2
Sum of Saturated fatty acids	43	55	38	33	28	35	32
Sum of	57	45	62	67	72	65	68

Unsaturated fatty acids							
Sum of Poly unsaturated fatty acids	33	8.8	36	41	50	35	--
Solid Fat Content (SFC)							
At 10°C	37.65	52.5	29.07	21.18	14.41	24.37	24.05
At 40°C	0.61	0	0.41	0	0	0.03	0.94

Food product

[0064] The margarines were prepared as follows:

Blending the oils and heating to 70℃, transfer emulsifiers lecithin and monoglycerides to the oil blend.

Dissolve salt in the water phase and adjust the temperature to 60℃

Transfer the water phase into oil blend and emulsify with agitator for 30 minutes.

Pass the emulsion through the chilling and kneading machine and pack.

Temper the margarine at 15℃ for 2 days, then storage in 5℃

[0065] Ingredient composition, plasticity measurement, and heat stability measurements of seven formulations of non-hydrogenated vegetable fat composition are shown in Table 1.

[0066]

Table 1

Formulation	**AM-1**	**AM-2**	**AM-3**	**AM-4**	**AM-5**	**AM-6**	**AM-7**

Ingredients (wt.%, expressed on total weight of the fat composition)							
Fat composition	FC-1	FC-2	FC-3	FC-4	FC-5	FC-6	FC-7
Oil/water content (wt.%, expressed on total weight of the fat composition)							
Oil content	83.1	82.8	83.1	83.1	83.1	83.1	83.1
Water content	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Plasticity (g/cm^2)							
Hardness at 5°C	715	2363	451	273	157	594	658
Hardness at 30°C	100	8	80	55	8	8	40
Slipping Melting Point ℃	33.7	32.9	33.1	31	28.6	30.2	34.9
Heat stability	Heat stable	Not heat stable	Heat stable	Heat stable	Not heat stable	Not heat stable	Not heat stable

CLAIMS

What is claimed is:

1. A non-hydrogenated vegetable fat composition comprising:
    a. a liquid oil; and
    b. a hardstock fat;

    wherein the liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, and the hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition.
2. The non-hydrogenated vegetable fat composition according to claim 1, wherein the fat composition comprises a triglyceride composition comprising, based on total weight of the triglycerides, a content of C54 triglycerides in an amount of from 30 to 50 wt.%.
3. The non-hydrogenated vegetable fat composition according to any one of the preceding claims, wherein the fat composition comprises a triglyceride composition comprising, based on total weight of the triglycerides, a combined content of C44 to C48 triglycerides in an amount of from 10 to 25 wt.%.
4. The non-hydrogenated vegetable fat composition according to any one of the preceding claims, wherein the hardstock fat is an interesterified fat obtained by subjecting to an interesterification a blend of an amount of 25 to 45 wt.%, or 35 to 40 wt.%, of at least one lauric fat, and an amount of 55 to 75 wt.%, or 60 to 65 wt.%, of at least one non-lauric fat based on the weight of the hardstock fat.
5. The non-hydrogenated vegetable fat composition according to any one of the preceding claims, wherein the non-lauric fat is selected from the group consisting of palm oil, soybean oil, rapeseed oil, maize oil, sunflower oil, flaxseed oil, and a blend of two or more thereof.
6. The non-hydrogenated vegetable fat composition according to any one of the preceding claims, wherein the lauric fat is selected from the group consisting of palm kernel oil, palm kernel stearin, palm kernel olein, coconut oil, coconut stearin, coconut olein, and a blend of two or more thereof.
7. The non-hydrogenated vegetable fat composition according to any one of the preceding claims, wherein the fat composition has a solid fat content (SFC) which is at least 38 wt.% at 10°C and less than 3 wt.% at 40°C.

8. The non-hydrogenated vegetable fat composition according to any one of the preceding claims, wherein the fat composition has a fatty acid profile comprising, based on total weight of the fatty acids, a combined content of C12 and C16 fatty acids in an amount of from 25 to 34 wt.%.
9. The non-hydrogenated vegetable fat composition according to any one of the preceding claims, wherein the fat composition has a fatty acid profile comprising, based on total weight of the fatty acids, a content of C18:0 fatty acids in an amount of from 4.2 to 4.4 wt.%, a content of C18:1 fatty acids in an amount of from 24.2 to 25.9 wt.%, a content of C18:2 fatty acids in an amount of from 29.6 to 36.9 wt.%, and a content of C18:3 fatty acids in an amount of from 3.5 to 4.1 wt.%.
10. A method for preparing a non-hydrogenated vegetable fat composition according to any one of claims 1 to 9, comprising the step of:
    a. blending a liquid oil and a hardstock fat;

    wherein the liquid oil is present in an amount of 25 to 75 wt.%, 25 to 70 wt.%, or 35 to 45 wt.%, and the hardstock fat is present in an amount of 25 to 75 wt.%, 30 to 75 wt.%, or 55 to 65 wt.%, based upon total weight of the fat composition.
11. A food product comprising a food ingredient different from a fat, and the non-hydrogenated vegetable fat composition according to any one of claims 1 to 9.
12. The food product according to claim 11, wherein the food product is selected from the group consisting of margarine, shortening, non-dairy topping, non-dairy cream, filling, and spread.
13. The food product according to any one of claims 11 and 12, wherein the margarine has a slipping melting point (SMP) of less than or equal to 36°C.
14. The food product according to any one of claims 11 to 13, wherein the margarine has a plasticity of at least 50 g/cm^2.
15. Use of the non-hydrogenated vegetable fat composition according to any one of claims 1 to 10 to reduce oil leakage from a food product selected from the group consisting of margarine, shortening, non-dairy topping, non-dairy cream, filling, and spread.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/086842

A. CLASSIFICATION OF SUBJECT MATTER

A23D9/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC:A23D,A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS,CNTXT,DWPI,VEN,CNKI,CJFD:fat,oil,hydrogenated,triglyceride+,interesterifi+,vegetable,plant,blend+,C12:0,C44,C48,C54,C18:0,C18:1,C18:2,C18:3,lauric,palm oil,soybean oil,rapeseed oil,maize oil,sunflower oil,flaxseed oil,kernel,coconut,stearin,olein,SFC,margarine,shortening,topping,cream,spread.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 115915949 A (CARGILL, INCORPORATED) 04 April 2023 (2023-04-04) the description,the paragraph 61, 67-68, 76, 83, 87, 107-111, 161	1
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☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 August 2023	**04 January 2024**

Name and mailing address of the ISA/CN	Authorized officer
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2023/086842

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