DESCRIPTION

Title of Invention: LIQUID OIL AND/OR FAT FOR WATER-IN-OIL EMULSIONS

Technical Field

[0001]

The present invention relates to a liquid oil and/or fat for a water-in-oil emulsion.

Background Art

[0002]

In a water-in-oil emulsion, an oil phase is generally composed of a plurality of oils and/or fats for the purpose of adjusting the required physical properties. When these oils and/or fats are roughly classified for convenience into high-melting-point oils and/or fats, middle-melting-point oils and/or fats, and low-melting-point oils and/or fats according to the melting point of the oils and/or fats, the high-melting-point oils and/or fats serve to impart heat-resistant shape retention and hardness, the middle-melting-point oils and/or fats serve to secure the balance between plasticity and hardness, and the low-melting-point oils and/or fats serve to impart flexibility and smoothness to the structure. An oil and/or fat having any of the melting points is selected in consideration of the physical properties and flavor required for the water-in-oil emulsion.

[0003]

The water-in-oil emulsion is required to have a certain degree of hardness in order to ensure ease of molding and shape retention. Meanwhile, in order to ensure workability such as spreadability on bread and kneading into a dough, plasticity and flexibility are also required, and excessive hardness is not preferable in this application. Therefore, it is necessary that the hardness of the water-in-oil emulsion falls within an appropriate range for the purpose of using the water-in-oil emulsion in a wide range of applications.

[0004]

The water-in-oil emulsion is often required to contain a certain amount of solid fats in order to satisfy the requirements of hardness and heat resistance. In this case, due to the presence of the solid fats, there are issues that the food has a strong oily feeling and lacks freshness when eaten, and that the food contains a large amount of fatty acids to be avoided such as saturated fatty acids and trans fatty acids. In order to avoid these issues, it is conceivable to reduce the proportion of the oil phase contained in the water-in-oil emulsion and increase the proportion of the aqueous phase. However, in this case, there is an issue that the emulsion stability is lowered, so that syneresis occurs to impair the safety of distribution as a food product.

[0005]

As a solution to the issues caused by increasing the proportion of the aqueous phase in the water-in-oil emulsion, there have been widely proposed techniques such as a technique of blending

preferably less than 2 wt.%, and most preferably less than 0.5 wt.%. If the content of the BO2 triglyceride exceeds 10 wt.%, plasticity may be deteriorated.

[0023]

In the liquid oil and/or fat for a water-in-oil emulsion of the present invention, the total content of an S2U triglyceride and an SSS triglyceride is preferably from 5 to 35 wt.%, more preferably from 7 to 30 wt.%, and still more preferably from 10 to 25 wt.%. If the total content of the S2U triglyceride and the SSS triglyceride exceeds 35 wt.%, the oil phase becomes too hard and rigid, so that the water-in-oil emulsion may tend to cause syneresis. On the other hand, if it is less than 5 wt.%, the hardness may be insufficient.

Note that S represents a saturated fatty acid having from 16 to 22 carbons, U represents an unsaturated fatty acid having 18 carbons, the S2U triglyceride represents a triglyceride in which two molecules of S and one molecule of U are bonded together, and the SSS triglyceride represents a triglyceride in which three molecules of S are bonded together.

[0024]

The liquid oil and/or fat for a water-in-oil emulsion of the present invention is preferably a liquid fraction (shea olein) obtained by fractionation of shea butter, or a low melting point fraction obtained by fractionation of an interesterified oil that is obtained by random interesterification. The liquid oil and/or fat for a water-in-oil emulsion of the present invention is more preferably a liquid fraction (shea olein) obtained by fractionation of shea butter, or a low melting point fraction obtained by fractionation of an interesterified oil that is obtained by mixing only an oil and/or fat raw material having a lauric acid content of 2 wt.% or less and subjecting the raw material to random interesterification.

[0025]

The oil phase contained in the water-in-oil emulsion of the present invention can be prepared by adding and dissolving/dispersing oil-soluble components such as a pigment, an antioxidant, and/or a perfume as needed in addition to the liquid oil and/or fat for a water-in-oil emulsion described above and the oil and/or fat described below.

[0026]

The water-in-oil emulsion of the present invention is substantially free of water-soluble dietary fiber.

In the present invention, the term “water-soluble dietary fiber” refers to, among indigestible carbohydrates that are contained in foods and hardly undergo digestion and absorption in human digestive organs, water-soluble carbohydrates. Specific examples thereof include indigestible polysaccharides such as inulin, indigestible dextrin, polydextrose, agar-agar, sodium alginate, gum arabic, beet fiber, xanthan gum, guar gum, partially hydrolyzed guar gum, indigestible starch, and

degummed shea butter to 81.5 wt.% of acetone. The temperature was gradually lowered while the mixture was weakly stirred. After reaching 2.5°C, the temperature was held at a constant temperature for about 30 minutes, and the resulting mixed liquid was filtered to give a liquid fraction (shea olein) and a solid fraction (shea stearin). The shea olein in the liquid fraction (fractionated low melting point fraction) was decolored and deodorized by a routine method to give a liquid oil and/or fat 1. The liquid oil and/or fat 1 had a solid fat content of 0.5% at 25°C.

[0041]

(Liquid Oil and/or Fat 2)

A blended oil (the main fatty acid composition was C16 = 48.6 wt.%, C18 = 15.1 wt.%, C18:1c = 28.7 wt.%, C18:2c = 5.0 wt.%) of palm oil, palm fractionated high melting point fraction, extremely hardened high oleic sunflower oil, and high oleic sunflower oil was subjected to random interesterification using sodium methylate, and a low melting point fraction obtained by fractionation with acetone was decolored and deodorized by a routine method to give a liquid oil and/or fat 2. The liquid oil and/or fat 2 had a solid fat content of 1.2% at 25°C.

[0042]

(Liquid Oil and/or Fat 3)

A low melting point fraction obtained by fractionation of palm mid fraction (PMF) with acetone was decolored and deodorized by a routine method to give a liquid oil and/or fat 3. The liquid oil and/or fat 3 had a solid fat content of 1.3% at 25°C.

[0043]

(Liquid Oil and/or Fat 4)

High oleic sunflower oil and stearic acid were subjected to interesterification using a lipase having 1,3-position specificity, and a low melting point fraction obtained by fractionation with hexane was decolored and deodorized by a routine method to give a liquid oil and/or fat 4. The liquid oil and/or fat 4 had a solid fat content of 0.1% at 25°C.

[0044]

(Liquid Oil and/or Fat 5)

High oleic sunflower oil and behenic acid were subjected to interesterification using a lipase having 1,3-position specificity, and a low melting point fraction obtained by fractionation with hexane was decolored and deodorized by a routine method to give a liquid oil and/or fat 5. The liquid oil and/or fat 5 had a solid fat content of 5.7% at 25°C.

[0045]

(Liquid Oils and/or Fats 6 to 9)

In addition to the vegetable oils and/or fats described above, refined rapeseed oil (available from FUJI OIL CO., LTD.) was used as a liquid oil and/or fat 6, edible rice oil (available from

CLAIMS

[Claim 1]

A liquid oil and/or fat for a water-in-oil emulsion, satisfying all of (A) to (D):

(A) a total content of palmitic acid and stearic acid is from 10 to 45 wt.% in a constituent fatty acid composition;

(B) a total content of oleic acid and linoleic acid is from 55 to 80 wt.% in a constituent fatty acid composition;

(C) a content of a diglyceride is 8 wt.% or more; and

(D) a content of an SU2 triglyceride is from 30 to 70 wt.%,

wherein S represents a saturated fatty acid having from 16 to 22 carbons, U represents an unsaturated fatty acid having 18 carbons, and the SU2 triglyceride represents a triglyceride in which one molecule of S and two molecules of U are bonded together.

[Claim 2]

A water-in-oil emulsion substantially free of water-soluble dietary fiber and an emulsifier other than lecithin, the water-in-oil emulsion comprising at least the liquid oil and/or fat for a water-in-oil emulsion according to claim 1 and having a proportion of an aqueous phase of from 25 to 70 wt.%.

[Claim 3]

The water-in-oil emulsion according to claim 2, wherein the water-in-oil emulsion comprises 5 to 50 wt.% of the liquid oil and/or fat for a water-in-oil emulsion, and an oil phase satisfies all of (a) to (c):

(a) after complete dissolution, a solid fat content that is generated by holding the oil phase at 0°C for 5 minutes is from 15 to 40%;

(b) after complete dissolution, a solid fat content that is generated by holding the oil phase at 5°C for 7 days is from 25 to 55%; and

(c) a (b)/(a) ratio is from 0.9 to 1.4.

[Claim 4]

The water-in-oil emulsion according to claim 3, comprising 70 wt.% or less of an oil and/or fat containing, in a constituent fatty acid composition, 20 wt.% or more of a fatty acid having 14 or less carbons.

[Claim 5]

The water-in-oil emulsion according to claim 3, comprising 8 wt.% or less of an oil and/or fat containing, in a constituent fatty acid composition, 90 wt.% or more of a saturated fatty acid having 16 or more carbons.

[Claim 6]

The water-in-oil emulsion according to claim 4, comprising 8 wt.% or less of an oil and/or fat containing, in a constituent fatty acid composition, 90 wt.% or more of a saturated fatty acid having 16 or more carbons.

[Claim 7]

The liquid oil and/or fat for a water-in-oil emulsion according to claim 1, which is shea olein.

[Claim 8]

The liquid oil and/or fat for a water-in-oil emulsion according to claim 1, which is a low melting point fraction obtained by fractionation of an interesterified oil that is obtained by random interesterification.

[Claim 9]

A method for inhibiting syneresis of a water-in-oil emulsion by using a liquid oil and/or fat satisfying all of (A) to (D):

(A) a total content of palmitic acid and stearic acid is from 10 to 45 wt.% in a constituent fatty acid composition;

(B) a total content of oleic acid and linoleic acid is from 55 to 80 wt.% in a constituent fatty acid composition;

(C) a content of a diglyceride is 8 wt.% or more; and

(D) a content of an SU2 triglyceride is from 30 to 70 wt.%,

wherein S represents a saturated fatty acid having from 16 to 22 carbons, U represents an unsaturated fatty acid having 18 carbons, and the SU2 triglyceride represents a triglyceride in which one molecule of S and two molecules of U are bonded together.

[Claim 10]

The method according to claim 9, wherein the water-in-oil emulsion has a proportion of an aqueous phase of from 25 to 70 wt.%.