OIL AND FAT COMPOSITION CONTAINING UNSATURATED FATTY ACID

BACKGROUND OF THE INVENTION

Technical Field

[0001] The present invention relates to an oil and fat composition containing unsaturated fatty acid capable of being used in nursery formulated milk.

Related Art

[0002] Unsaturated fatty acid, particularly eicosapentaenoic acid (EPA) or docosahexaenoic acid (DHA), may be formulated in a nursery formulated milk as nutrients necessary for infants.

Unsaturated fatty acids contain double bonds that are oxidized with time and may have a strange taste. This phenomenon is apt to happen for EPA and DHA that have multiple double bonds.

There is patent literature 1 as an application relating to oil and fat used in a nursery formulated milk. Here, patent literature 1 discloses a manufacturing method of molecularly distilling fish oil at a predetermined temperature in order to simultaneously improve DHA and cholesterol.

Patent literature 2 is an application entitled “Highly Unsaturated Fatty Acid-Containing Oil and fat Powder Excellent in Oxidation Stability and Method of Producing the Same” and discloses that “it is possible to obtain highly unsaturated fatty acid-containing oil and fat powder excellent in oxidation stability by formulating highly unsaturated fatty acid-containing oil and fat in combination of two types of lecithin, i.e., lecithin having a phosphatidylcholine content of 55% or more and enzymatically

amount of phosphatidylinositol is less than 0.48.

(5) the oil and fat composition according to (1), in which a sum of DHA and EPA is 0.25 mass% or more.

(6) the oil and fat composition according to (2), in which a sum of DHA and EPA is 0.25 mass% or more.

(7) the oil and fat composition according to (3), in which a sum of DHA and EPA is 0.25 mass% or more.

(8) the oil and fat composition according to (4), in which a sum of DHA and EPA is 0.25 mass% or more.

(9) a method of manufacturing an oil and fat composition by the following steps:

1: a step of adjusting pH to 3.6 or more and dissolving one or more selected from ascorbic acid and salts thereof to prepare an aqueous phase;

2: a step of dissolving lecithins in an oil and fat to prepare an oil phase;

3: a step of finely dispersing the aqueous phase obtained in 1 in the oil phase obtained in 2, to obtain a water-in-oil type emulsion; and

4: a step of mixing the water-in-oil type emulsion obtained in 3 with an oil and fat containing unsaturated fatty acid to form an oil and fat composition containing 0.3 to 22 mass% of the aqueous phase.

(10) the method of manufacturing an oil and fat composition according to (9), in which the aqueous phase includes the one or more selected from ascorbic acid and salts thereof as essential components and additionally dissolves a pH adjuster.

(11) the method of manufacturing an oil and fat composition according to (9), in which in the lecithins, a value obtained by dividing an amount of phosphatidylcholine

in the lecithins by the sum of the amount of phosphatidylcholine, an amount of phosphatidylethanolamine, and an amount of phosphatidylinositol is less than 0.48.

(12) the method of manufacturing an oil and fat composition according to (10), in which in the lecithins, a value obtained by dividing an amount of phosphatidylcholine in the lecithins by the sum of the amount of phosphatidylcholine, an amount of phosphatidylethanolamine, and an amount of phosphatidylinositol is less than 0.48.

(13) the method of manufacturing an oil and fat composition according to any one of (9) to (12), in which a sum of DHA and EPA is 0.25 mass% or more.

(14) the oil and fat composition according to any one of (1) to (8), which is used for nursery formulated milk.

(15) a nursery formulated milk including the oil and fat composition according to any one of (1) to (8).

[0008] In other words,

(21) an oil and fat composition satisfying the following conditions:

1: 0.3 to 22 mass% of an aqueous phase, in which one or more selected from ascorbic acid and salts thereof are dissolved and pH is adjusted to 3.6 or more, is present in a state of being dispersed in an oil phase;

2: an amount of a solid content in the aqueous phase is 22.80 to 85 mass%; and

3: the oil phase contains an oil and fat including unsaturated fatty acid and lecithins.

(22) the oil and fat composition according to (21), in which the aqueous phase includes the one or more selected from ascorbic acid and salts thereof as essential

components and additionally includes a pH adjuster dissolved therein.

(23) the oil and fat composition according to (21) or (22), in which in the lecithins, a value obtained by dividing an amount of phosphatidylcholine in the lecithins by the sum of the amount of phosphatidylcholine, an amount of phosphatidylethanolamine, and an amount of phosphatidylinositol is less than 0.48.

(24) the oil and fat composition according to any one of (21) to (23), in which a sum of DHA and EPA is 0.25 mass% or more.

(25) a method of manufacturing an oil and fat composition by the following steps:

1: a step of adjusting pH to 3.6 or more and dissolving one or more selected from ascorbic acid and salts thereof to prepare an aqueous phase;

2: a step of dissolving lecithins in an oil and fat to prepare an oil phase;

3: a step of finely dispersing the aqueous phase obtained in 1 in the oil phase obtained in 2, to obtain a water-in-oil type emulsion; and

4: a step of mixing the water-in-oil type emulsion obtained in 3 with an oil and fat containing unsaturated fatty acid to form an oil and fat composition containing 0.3 to 22 mass% of the aqueous phase.

(26) the method of manufacturing an oil and fat composition according to (25), in which the aqueous phase includes the one or more selected from ascorbic acid and salts thereof as essential components and additionally dissolves a pH adjuster.

(27) the method of manufacturing an oil and fat composition according to (25) or (26), in which in the lecithins, a value obtained by dividing an amount of phosphatidylcholine in the lecithins by the sum of the amount of phosphatidylcholine, an amount of phosphatidylethanolamine, and an amount of phosphatidylinositol is less

than 0.48.

(28) the method of manufacturing an oil and fat composition according to any one of (25) to (27), in which a sum of DHA and EPA is 0.25 mass% or more.

(29) the oil and fat composition according to any one of (21) to (24), which is used for nursery formulated milk.

(30) a nursery formulated milk including the oil and fat composition according to any one of (21) to (24).

Effect

[0009] According to the present invention, it is possible to provide an oil and fat composition that contains unsaturated fatty acid and can prepare nursery formulated milk having a satisfactory taste.

DESCRIPTION OF THE EMBODIMENTS

[0010] An oil and fat composition according to the present invention includes an oil phase that is made of oil and fat and components dissolved in oil and fat and acts as a continuous phase, and an aqueous phase that is made of water and components dissolved in water and is dispersed in the oil phase.

Moreover, in the preparation of the oil and fat composition according to the

present invention, after an aqueous phase is temporarily dispersed in a predetermined oil phase (also referred to as an “oil phase 1” in the present invention) to form an emulsion, the emulsion may be dispersed in oil and fat (also referred to as an “oil phase 2” in the present invention), and a final oil and fat composition is obtained. The “final oil and fat composition” is the oil and fat composition of the present invention, but the oil phase in the present product is a mixture of the oil phase 1 and the oil phase 2, and this oil phase may be referred to as an “oil phase 3” in the present invention. Hereinafter, the

product other than these cases is presented as "△" in Table 2. "△" and "○" are determined as acceptable.

With each oil and fat composition immediately after the preparation, oxidation stability was measured by a conductometric determination method (CDM) test. This is also presented in Table 2. Moreover, the measurement of the oxidation stability by the CDM test was performed according to "○ Method of measuring oxidation stability by CDM test".

A product in which precipitation occurred was determined as unacceptable, and a CDM value is not presented.

In each test section in Table 1, with respect to Examples 1 to 20, 29 to 33, and 35 to 52, the CDM test was performed by using a mixture of 20 of soybean oil with 80 of "DHA and EPA-containing oil and fat" as control oil and fat. With respect to Example 34, the CDM test was performed by using a mixture of 10 of soybean oil with 90 of "DHA and EPA-containing oil and fat" as control oil and fat. With respect to Example 53, the CDM test was performed by using a mixture of 99 of soybean oil with 1 of "DHA and EPA-containing oil and fat" as control oil and fat. With respect to Examples 21 to 28, the CDM test was performed by using respective "DHA and EPA-containing oil and fat" as control oil and fat. Results thereof are presented in Table 2. A product having a higher CDM value than the value of the control was determined as acceptable.

Moreover, the heating temperature in a case of the CDM test of the control oil and fat was determined according to each of the examples and comparative examples.

[0031] Table 1 Formulation of oil and fat composition

wherein a sum of DHA and EPA is 0.25 mass% or more.

6. The oil and fat composition according to claim 2,

wherein a sum of DHA and EPA is 0.25 mass% or more.

7. The oil and fat composition according to claim 3,

wherein a sum of DHA and EPA is 0.25 mass% or more.

8. The oil and fat composition according to claim 4,

wherein a sum of DHA and EPA is 0.25 mass% or more.

9. A method of manufacturing an oil and fat composition comprising following steps:

1: a step of adjusting pH to 3.6 or more and dissolving one or more selected from ascorbic acid and salts thereof to prepare an aqueous phase;

2: a step of dissolving lecithins in an oil and fat to prepare an oil phase;

3: a step of finely dispersing the aqueous phase obtained in 1 in the oil phase obtained in 2 to obtain a water-in-oil type emulsion; and

4: a step of mixing the water-in-oil type emulsion obtained in 3 with an oil and fat containing unsaturated fatty acid to form an oil and fat composition containing 0.3 to 22 mass% of the aqueous phase.

10. The manufacturing method according to claim 9,

wherein the aqueous phase comprises the one or more selected from ascorbic acid and salts thereof as essential components and additionally dissolves a pH adjuster.

11. The method of manufacturing an oil and fat composition according to claim 9,

wherein in the lecithins, a value obtained by dividing an amount of phosphatidylcholine in the lecithins by a sum of the amount of phosphatidylcholine, an

amount of phosphatidylethanolamine, and an amount of phosphatidylinositol is less than 0.48.

12. The method of manufacturing an oil and fat composition according to claim 10,

wherein in the lecithins, a value obtained by dividing an amount of phosphatidylcholine in the lecithins by a sum of the amount of phosphatidylcholine, an amount of phosphatidylethanolamine, and an amount of phosphatidylinositol is less than 0.48.

13. The method of manufacturing an oil and fat composition according to any one of claims 9 to 12,

wherein a sum of DHA and EPA is 0.25 mass% or more.

14. The oil and fat composition according to any one of claims 1 to 8, which is used for a nursery formulated milk.

15. A nursery formulated milk comprising the oil and fat composition according to any one of claims 1 to 8.