The oil and/or fat c is at least one type of oil and/or fat selected from the group consisting of soybean oil, rapeseed oil, corn oil, sunflower oil, safflower oil, perilla oil, linseed oil, high oleic sunflower oil, high oleic rapeseed oil, and high oleic safflower oil.

[0029]

In the oil and/or fat composition for infant formula according to an embodiment of the present invention, a blended amount of the oil and/or fat a is preferably from 30 wt.% to 50 wt.%, a blended amount of the oil and/or fat b is preferably from 20 wt.% to 40 wt.%, and a blended amount of the oil and/or fat c is preferably from 10 wt.% to 30 wt.%. Producing oils or fats for infant formula at the blending ratio mentioned above can result in a fatty acid composition close to the fatty acid composition of breast milk, which is required for oils or fats for infant formula.

[0030]

In an embodiment of the present invention, the content of glycidol and glycidol fatty acid esters is measured by the following method.

[0031]

0.3 mL of isooctane is added to 100 mg of an oil and/or fat sample to dissolve the oil and/or fat sample. 3 mL of sodium bromide solution containing 90 U/mL lipase is added to a test tube, and the test tube is shaken on a shaker for 30 minutes. The test tube is heated at 80°C for 10 minutes, and then is allowed to be cooled or water-cooled to room temperature. 50 μL of 2.0 μg/mL internal standard mixed solution and 3 mL of hexane are added to the test tube, and the test tube is capped. The test tube is stirred with a vortex mixer. After centrifugation, the aqueous layer is transferred to a new test tube using a Pasteur pipet. 3 mL of hexane is added to the test tube to which the aqueous layer has been transferred, and the test tube is capped. The test tube is stirred with a vortex mixer. After centrifugation, the organic layer is removed. 20 μL of phenylboronic acid solution and 3 mL of hexane are added to the test tube, and the test tube is capped. The test tube is shaken on a shaker for 10 minutes. The organic layer is transferred to a new test tube using a Pasteur pipet. The organic layer in the new test tube is concentrated to 0.5 to 0.8 mL under nitrogen, and then analyzed by GC-MS.

Note that, in the GC-MS, molecular ion peaks m/z 147 and m/z 150 are used in the quantification.

[0032]

In a preferred embodiment, the oil and/or fat composition for infant formula according to the present invention has a 3-MCPD concentration of 0.4 mg/kg or less and a content of glycidol and glycidol fatty acid esters of 0.2 mg/kg or less in terms of glycidol equivalent.

Examples

[0033]

The present invention will be described in more details using examples presented below. Note that in the examples, "%" indicates weight basis.

were used as raw materials, and an aqueous solution of an acid was added during bleaching, oil and/or fat compositions for infant formula having good flavor, a 3-MCPD concentration of 0.4 mg/kg or less, and a content of glycidol and glycidol fatty acid esters reduced to 0.2 mg/kg or less in terms of glycidol equivalent were obtained. The deodorization temperatures of the refined, bleached, and deodorized palm oils (RBDPOs) at this time were from 230 to 260°C.

[0046]

In Comparative Example 1, an aqueous solution of an acid was not added during bleaching. In this case, the glycidol equivalent was 0.29 mg/kg.

In Comparative Example 2, the deodorization temperature was set to 265°C. In this case, the glycidol equivalent was 0.45 mg/kg.

In Comparative Example 3, the 3-MCPD concentration in the palm oil serving as a raw material was 0.5 mg/kg or greater. In this case, the 3-MCPD concentration after deodorization was 0.62 mg/kg, and the glycidol equivalent was 0.55 mg/kg.

In Comparative Example 4, the deodorization temperature was set to 210°C. In this case, the flavor was scored as 2.6.

[0047]

Similar to Patent Documents 2 and 3, the refined, bleached, and deodorized palm oils used in an embodiment of the present invention were refined, bleached, and deodorized palm oils degummed using phosphoric acid. However, in comparative examples that do not satisfy the configuration of the present invention, the content of glycidol and glycidol fatty acid esters could not be reduced.

[0048]

The above results are summarized in Table 2. An oil and/or fat composition for infant formula having good flavor, a 3-MCPD concentration of 0.4 mg/kg or less, and a content of glycidol and glycidol fatty acid esters reduced to 0.2 mg/kg or less in terms of glycidol equivalent can only be obtained when an aqueous solution of an acid is added during the bleaching operation, a raw material having a 3-MCPD concentration of 0.5 mg/kg or less in the raw material oil is used, and deodorization is performed at a deodorization temperature of from 230 to 260°C.

[0049]

[Table 2]