

CREAM CHEESE-LIKE FOOD

Technical Field

[0001]

5 The present invention relates to a cream cheese-like food.

Background Art

[0002]

10 In recent years, a cream cheese is used in a variety of utilities as a raw material for a confectionery and a bakery product such as western confectionery and breads because the soft texture, the smooth meltability in the mouth, and the refreshing sourness of natural cheese
15 thereof are preferred.

[0003]

 However, cream cheese is relatively weak in a baking resistance, for example, when the cream cheese is put and baked as a filling of a bread, it does not remain after
20 baking, or becomes spattered, in many cases. In addition, when cream cheese is used as a raw material for a cheesecake, there is also a problem that the cheese has hard physical properties and poor handling properties.

[0004]

25 On the other hand, as a cream cheese-like food, some

pasty foods using lactic acid-fermented milk have been proposed, but when the texture, meltability in the mouth and flavor like a cream cheese are pursued, a sufficient baking resistance is not obtained (Patent Documents 1,3,4 and 5) and, when one tries to impart a baking resistance, a food satisfying the texture, meltability in the mouth and flavor is not obtained (Patent Document 2). Thus, it is difficult to satisfy all of the texture, flavor like a cream cheese and sufficient baking resistance.

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Prior Art Documents

Patent Documents

[0005]

Patent Document 1: JP 08-9882 A

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Patent Document 2: JP 2000-210017 A

Patent Document 3: JP 2000-279121 A

Patent Document 4: JP 2004-357522 A

Patent Document 5: JP 2006-320269 A

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Summary of the Invention

Problems to be Solved by the Invention

[0006]

An object of the present invention is to provide a cream cheese-like food which has such a baking resistance as being sufficient for use as a raw material for a

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confectionery and a bakery product to be heated and has good handling properties while sustaining the soft texture and smooth meltability in the mouth like a cream cheese and the refreshing sourness like a natural cheese.

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Means for Solving the Problems

[0007]

Then, the present inventors have intensively studied. As a result, the inventors have found out that a cream
10 cheese-like food, which is produced by using fermented milk prepared by lactic acid-fermentation of a cream mix containing a milk material and water, and which comprises 5 to 15 wt% of protein, 1 to 10 wt% of crosslinked starch and 10 to 30 wt% of fat and oil, can satisfy the texture and
15 flavor of cream cheese while sustaining a sufficient baking resistance. And the inventors have completed the cream cheese-like food of the present invention based on this finding.

[0008]

20 That is, a first aspect of the present invention is a cream cheese-like food comprising fermented milk prepared by lactic acid-fermentation of an oil in water type emulsion containing a milk material, fat and oil, and water, wherein the cream cheese-like food comprises 5 to 15 wt% of
25 protein, 1 to 10 wt% of crosslinked starch and 10 to 30 wt%

of fat and oil. A second aspect of the present invention is the cream cheese-like food according to the first aspect, wherein the cream cheese-like food comprises 0.1 to 2 wt% of protein derived from egg white. A third aspect of the present invention is the cream cheese-like food according to the first aspect, wherein the cream cheese-like food comprises 0.5 to 5 wt% of crosslinked starch derived from rice and/or tapioca.

10 Effects of the Invention

[0009]

According to the present invention, it can be provided that a cream cheese-like food which has such a baking resistance as being sufficient for a raw material for a confectionery and a bakery product to be heated and has good handling properties while sustaining the soft texture and smooth meltability in the mouth like a cream cheese and the refreshing sourness like a natural cheese.

20 Mode for Carrying Out the Invention

[0010]

Embodiments of the present invention will be described in detail below.

[0011]

25 The cream cheese-like food of the present invention

comprises 5 to 15 wt% of protein, and examples of the protein include milk products such as milk, processed milk, fresh cream, defatted milk, skim milk powder, defatted concentrated milk, whole milk powder, butter milk powder, whey powder, natural cheese and processed cheese, caseins such as acid casein, rennet casein, casein sodium, casein calcium and casein potassium, milk proteins such as total milk protein and whey protein, and various proteins derived from animal and plant.

10 [0012]

It is preferable that the cream cheese-like food of the present invention comprises 5 to 15 wt%, preferably 6 to 12 wt% of the protein. When the amount of the protein is less than 5 wt%, the flavor and rich body peculiar to cream cheese are lacked, and a baking resistance is deteriorated. When the amount of the protein is more than 15 wt%, a crumbly hard texture is caused, and smooth melting in the mouth is not obtained. Therefore they are not preferable.

20 [0013]

It is preferable that the cream cheese-like food of the present invention comprises 0.1 to 2 wt% of protein derived from egg white among the aforementioned proteins. This makes it possible to effectively impart a baking resistance without increasing a ratio of protein in the

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cream cheese-like food too much when the cream cheese-like food is used as a raw material for a confectionery and a bakery product to be heated. When the amount of the protein derived from egg white is less than 0.1 wt%, a sufficient baking resistance is difficult to obtain. When the amount of the protein derived from egg white is more than 2 wt%, the texture becomes unusual and a smooth texture like a cream cheese is difficult to obtain.

[0014]

The cream cheese-like food of the present invention comprises 1 to 10 wt% of crosslinked starch, and examples of the crosslinked starch include acetylated distarch adipate, acetylated distarch phosphate, hydroxypropyl distarch phosphate, phosphated distarch phosphate and distarch phosphate, and by using these crosslinked starches, the smooth texture and rich body can be imparted.

[0015]

It is preferable that the cream cheese-like food of the present invention comprises 1 to 10 wt%, preferably 2 to 8 wt% of the crosslinked starch. When the amount of the crosslinked starch is less than 1 wt%, the flavor and rich body peculiar to a cream cheese are lacked and a baking resistance is also deteriorated. When the amount of the crosslinked starch is more than 10 wt%, slimy and hard texture is caused. Therefore, they are not preferable.

[0016]

It is preferable that the cream cheese-like food of the present invention comprises 0.5 to 5 wt% of crosslinked starch derived from rice and/or tapioca among the
5 aforementioned crosslinked starches. This makes it possible to obtain the smooth, no slimy, and soft texture peculiar to a cream cheese.

[0017]

The cream cheese-like food of the present invention
10 comprises fat and oil, sugars, lactic acid-fermented milk and water, and examples of the fat and oil include milk fats derived from butter and fresh cream, vegetable fats such as rapeseed oil, soybean oil, sunflower seed oil, cottonseed oil, peanut oil, rice bran oil, corn oil,
15 safflower oil, olive oil, kapok oil, sesame oil, evening primrose oil, palm oil, shea butter, sal fat, cacao butter, coconut oil and palm kernel oil, and animal fats such as beef tallow, lard, fish oil and whale oil, these fats can be used alone or in combination with a mixed oil thereof,
20 or processed fats obtained by subjecting these fats to fractionation, hydrogenation, transesterification etc., and it is preferable that the fat and oil is contained in an amount of 10 to 30 wt%. When the fat and oil is less than 10 wt%, the flavor and body property peculiar to the cream
25 cheese are lacked, and a baking resistance is also

deteriorated. When the amount of the fat or oil is more than 30 wt%, hard texture is caused and melting in the mouth is also deteriorated. Therefore they are not preferable. In addition, when a rapeseed palm mixed

5 hardened oil among the fats is used, a milky taste is more enhanced, and therefore it is preferable.

[0018]

In addition, examples of the sugars which can be used in the cream cheese-like food of the present invention
10 include carbohydrates derived from milk raw materials as well as sucrose, maltose, glucose, lactose, fructose, sorbitol and maltitol, and it is preferable that these carbohydrates are contained in an amount of 4 to 15 wt%.

[0019]

15 An emulsifying agent can be used for extent in which the flavor of the cream cheese-like food of the present invention is not adversely influenced. The emulsifying agent is not particularly limited and previously known emulsifying agents can be used, and examples thereof
20 include lecithin, sucrose fatty acid ester, propylene glycol fatty acid ester, sorbitan fatty acid ester, glycerin fatty acid ester, polyglycerin fatty acid ester, various organic acid monoglycerides such as acetic acid monoglyceride, tartaric acid monoglyceride, mixed acetic
25 and tartaric acid monoglyceride, citric acid monoglyceride,

diacetyltartaric acid monoglyceride and lactic acid monoglyceride, and polyoxyethylene sorbitan fatty acid ester.

[0020]

5 In addition to the above emulsifying agents, as known additives, a pH adjusting agent such as phosphate, and polysaccharide thickener such as guar gum and xanthan gum, can also be used.

[0021]

10 In the cream cheese-like food of the present invention, further, flavors such as milk flavor and cheese flavor, various spices, fruit purees and jams can be used for the purpose of imparting flavor, sweeteners such as sucralose, aspartame and stevia can be used for the purpose of
15 imparting sweetness, and coloring materials such as beta carotene, paprika dye and annatto dye can be used for the purpose of coloring. In addition, for the purpose of improving a shelf life, shelf-life improving agents such as glycine, sodium acetate and egg-white lysozyme can also be
20 used.

[0022]

 As a method for producing the cream cheese-like food of the present invention, an oil in water type emulsion containing milk raw materials and water is lactic acid-
25 fermented after the steps of homogenization, sterilization

and cooling. The lactic acid fermentation is performed at 15 to 45°C until the pH reaches 3.5 to 5.7, preferably 4 to 5.5; and the pH can also be adjusted using an organic acid or an alkaline salt after fermentation. When the pH is higher than 5.5, the shelf life tends to become shorter. When the pH is lower than 4, the sourness is strong, and therefore, balance of tastes as a whole food is deteriorated when used as a filling. Therefore, it is suitable to adjust the pH in the above ranges. Then, heat sterilization is performed at preferably 60 to 95°C. After sterilization of the lactic acid-fermented liquid, in the present invention, a cream cheese-like food is obtained by adding crosslinked starch, dietary salt, pH adjusting agent, flavor, sweetener and dye to the liquid without separating whey while whey separation is usually performed. As a final stage of the processes, heat homogenization and cooling are performed. In order to gelatinize starch, heating at 70 to 90°C and homogenization at 0 to 200 kgf/cm² are preferable.

[0023]

The cream cheese-like food produced by the above described method is given a sufficient baking resistance without deteriorating the soft texture and smooth melting in the mouth like a cream cheese, and the refreshing sourness like a natural cheese, and can provide good

handling properties as a raw material for a confectionery and a bakery product to be heated.

[0024]

The baking resistance of the cream cheese-like food of the present invention can be evaluated by the following method.

Filter paper is placed in a heat-resistant container having an inner diameter of 8.5 cm and a thickness of 3 cm with a circular metallic lid, 10 g of the cream cheese-like food is squeezed with a round tip having an inner diameter of 13 mm thereon, water corresponding to 10 wt% of the cream cheese-like food is added to the filter paper, the container is closed with the lid, and this is baked in an oven at 200°C for 10 minutes. The height before baking and the height after baking are measured and a height decrease rate is obtained from the following equation.

Height decreased rate (%) = $\{(\text{height before baking} - \text{height after baking}) / \text{height before baking}\} \times 100$

[0025]

By the combination of protein, crosslinked starch and fat and oil, the cream cheese-like food of the present invention has a baking resistance with sustaining the soft texture and smooth melting in the mouth like a cream cheese and the refreshing sourness like a natural cheese, and enables to realize both of the flavor and the physical

property. The cream cheese of the present invention enables the height decreased rate after baking by the above described evaluation method to be 50% or less, and enables to impart a more preferably 40% or less, further preferably
5 15% or less of baking resistance.

[0026]

The cream cheese-like food of the present invention has a sufficient baking resistance, and is suitable for use in the case where the cream cheese-like food is used in
10 baked cheesecake and topping of baked confectionary, is put and baked in breads, and is topped up and baked on breads. And the cream cheese-like food of the present invention can provide good handling properties as a raw material for a confectionery and a bakery product.

15 [0027]

The present invention will be described in more detail by way of the following examples.

Example 1

[0028]

20 22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase. Separately, 60 parts of water was warmed to about 30°C, and 15 parts of skim milk powder and 3 parts of total milk protein which had been mixed in a form of powder were
25 gradually added while stirring with a Homomixer to prepare

an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently after heat sterilization at 80°C for 30 minutes, to 95.8 parts of this fermented milk were added 3.4 parts of corn-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent, and 0.05 part of flavor. The mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 7.2 wt%, the amount of the crosslinked starch was 3.4 wt% and the amount of the fat and oil was 21.3 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, had a baking resistance such as a height decrease rate after baking of 42%, and had the soft texture and smooth melting in the mouth, and the refreshing

sourness like a natural cheese.

Example 2

[0029]

22 parts of rapeseed palm mixed hardened oil (melting
5 point 31°C) was warmed to 60°C to prepare an oil phase.
Separately, 57.0 parts of water was warmed to about 30°C,
and 15 parts of skim milk powder, 3 parts of total milk
protein and 3 parts of egg white powder which had been
mixed in a form of a powder were gradually added while
10 stirring with a Homomixer, to prepare an aqueous phase.
The oil phase was added to the aqueous phase, the mixture
was pre-emulsified at 70°C for 30 minutes, thereafter, the
emulsion was subjected to sterilization, and then
homogenized with a homogenizer under a pressure of 5MPa and
15 rapidly cooled to 20°C to prepare an oil in water type
emulsion. To the obtained oil in water type emulsion was
added 1 part of a lactic acid bacterium bulk starter for
cheese, and fermentation was performed at 20°C for 15 hours
to obtain fermented milk having a pH of 4.9. Subsequently,
20 after heat sterilization at 80°C for 30 minutes, to 95.8
parts of this fermented milk were added 1.9 parts of corn-
derived crosslinked starch, 1.4 parts of rice-derived
crosslinked starch, 0.3 part of dietary salt, 0.5 part of
pH adjusting agent, and 0.05 part of flavor, the mixture
25 was kneaded at 80°C for 10 minutes, and further,

homogenized under a pressure of 10MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 9.7 wt%, the amount of the crosslinked starch was 3.4 wt% (of this amount, the amount of the rice-derived crosslinked starch was 1.4 wt%), the amount of the fat and oil was 21.3 wt%, and the amount of the egg white-derived protein was 2.5 wt%. In addition, the resulting cream cheese-like food had a sufficient baking resistance such as a height decrease rate after baking of 8%, and had a slightly rough texture, but had the refreshing sourness like a natural cheese.

Example 3

[0030]

22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase. Separately, 66.6 parts of water was warmed to about 30°C, and 8 parts of skim milk powder, 3 parts of total milk protein and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then

homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 95.8 parts of this fermented milk were added 1.9 parts of corn-derived crosslinked starch, 1.4 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent, and 0.05 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10 MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 5.3 wt%, the amount of the crosslinked starch was 3.4 wt% (of this amount, the amount of the rice-derived crosslinked starch was 1.4 wt%), the amount of the fat and oil was 21.2 wt% and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, had a baking resistance such as a height decrease rate after baking of 38%, and had the soft texture and smooth melting in the mouth, and the refreshing sourness like a

natural cheese.

Example 4

[0031]

30 parts of rapeseed palm mixed hardened oil (melting
5 point 31°C) was warmed to 60°C to prepare an oil phase.
Separately, 51.6 parts of water was warmed to about 30°C,
and 15 parts of skim milk powder, 3 parts of total milk
protein and 0.4 part of egg white powder which had been
mixed in a form of a powder were gradually added while
10 stirring with a Homomixer, to prepare an aqueous phase.
The oil phase was added to the aqueous phase, the mixture
was pre-emulsified at 70°C for 30 minutes, thereafter, the
emulsion was subjected to sterilization, and then
homogenized with a homogenizer under a pressure of 5MPa and
15 rapidly cooled to 20°C to prepare an oil in water type
emulsion. To the obtained oil in water type emulsion was
added 1 part of a lactic acid bacterium bulk starter for
cheese, and fermentation was performed at 20°C for 15 hours
to obtain fermented milk having a pH of 4.9. Subsequently,
20 after heat sterilization at 80°C for 30 minutes, to 97.9
parts of this fermented milk were added 0.7 part of corn-
derived crosslinked starch, 0.6 part of rice-derived
crosslinked starch, 0.3 part of dietary salt, 0.5 part of
pH adjusting agent and 0.05 part of flavor, the mixture was
25 kneaded at 80°C for 10 minutes, and further, homogenized

under a pressure of 10 MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 7.7 wt%, the amount of the crosslinked starch was 1.3 wt% (of this amount, the amount of the rice-derived crosslinked starch was 0.6 wt%), the amount of the fat and oil was 29.5 wt%, and the amount of the egg white-derived protein was 0.33 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, had a baking resistance such as a height decrease rate after baking of 23%, and had the soft texture and smooth melting in the mouth, and the refreshing sourness like a natural cheese.

Example 5

[0032]

22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase. Separately, 59.6 parts of water was warmed to about 30°C, and 15 parts of slim milk powder, 3 parts of total milk protein and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the

emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 95.8 parts of this fermented milk were added 1.9 parts of corn-derived crosslinked starch, 1.4 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent, and 0.05 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10 MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 7.6 wt%, the amount of the crosslinked starch was 3.4 wt% (of this amount, the amount of the rice-derived crosslinked starch was 1.4 wt%), the amount of the fat and oil was 21.3 wt% and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, had a sufficient baking resistance such as a height decrease rate after baking of 8%, and had the soft texture

and smooth melting in the mouth, and the refreshing sourness like a natural cheese.

Example 6

[0033]

5 22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase. Separately, 47.6 parts of water was warmed to about 30°C, and 20 parts of skim milk powder, 10 parts of total milk protein and 0.4 part of egg white powder which had been
10 mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then
15 homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours
20 to obtain fermented milk having a pH 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 95.8 parts of this fermented milk were added 1.9 parts of corn-derived crosslinked starch, 1.4 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of
25 pH adjusting agent, and 0.05 part of flavor, the mixture

was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10 MPa, the homogenate was filled into a plastic tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food.

5 In the obtained cream cheese-like food, the amount of the protein was 14.6 wt%, the amount of the crosslinked starch was 3.4 wt% (of this amount, the amount of the rice-derived crosslinked starch was 1.4 wt%), the amount of the fat and oil was 21.4 wt% and the amount of the egg white derived
10 protein was 0.3 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, had a sufficient baking resistance such as a height decrease rate after baking of 8%, and had the soft texture and smooth melting in the mouth, and the refreshing sourness
15 like a natural cheese.

Example 7

[0034]

12 parts of rapeseed palm mixed hardened oil (melting points 31°C) was warmed to 60°C to prepare an oil phase.

20 Separately, 69.6 parts of water was warmed to about 30°C, 15 parts of skim milk powder, 3 parts of total milk protein and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was
25 added to the aqueous phase, the mixture was pre-emulsified

at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the
5 obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 91 parts of
10 this fermented milk were added 3.6 parts of corn-derived crosslinked starch, 4.6 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent, and 0.05 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a
15 pressure of 10 MPa, the homogenate was filled into a plastic tube, and the tube was closed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 7.2 wt%, the amount of the crosslinked starch was 8.2 wt% (of
20 this amount, the amount of the rice-derived crosslinked starch was 4.6 wt%), the amount of the fat and oil was 11.1 wt%, and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, had a sufficient
25 baking resistance such as a height decrease rate after

baking of 8%, and had the soft texture and smooth melting in the mouth, and the refreshing sourness like a natural cheese.

Example 8

5 [0035]

22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase. Separately, 59.6 parts of water was warmed to about 30°C, and 15 parts of skim milk powder, 3 parts of total milk
10 protein and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the
15 emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for
20 cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 95.8 parts of this fermented milk were added 1.9 parts of corn-derived crosslinked starch, 1.4 parts of tapioca-derived
25 crosslinked starch, 0.3 part of dietary salt, 0.5 part of

pH adjusting agent, and 0.05 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10 MPa, the homogenate was filled into a plastic film tube, and the tube was sealed
5 and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 7.6 wt%, the amount of the crosslinked starch was 3.4 wt% (of this amount, the amount of the tapioca-derived crosslinked starch was 1.4 wt%), the amount
10 of the fat and oil was 21.3 wt%, and the content of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, had a sufficient baking resistance such as a height decrease rate after baking of 8%, and had the soft
15 texture and smooth melting in the mouth, and the refreshing sourness of natural cheese.

[0036]

[Comparative Example 1]

According to the same manner as that of Example 1 of
20 Patent Document 1 (JP08-9882 A), each 0.05 part of lecithin and monoglyceride were added to 18 parts of rapeseed hardened oil (melting point 31°C) with warming at 60°C, and the mixture was stirred to dissolve, to prepare an oil phase. Separately, 57 parts of water was warmed to about
25 30°C, and 10 parts of skim milk powder which had been mixed

in a form of a powder was gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase and 15 parts of unsalted butter were added to the aqueous phase, the mixture was pre-emulsified at 70°C for 5 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid 10 bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 98.9 parts of this fermented milk were added 1 part of corn-derived crosslinked starch, 15 0.1 part of dietary salt, and 0.05 part of flavor, the mixture were kneaded at 80°C for 10 minutes and homogenized under a pressure of 10MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the 20 obtained cream cheese-like food, the amount of the protein was 3.3 wt%, the amount of the crosslinked starch was 1.0 wt% and the amount of the fat and oil was 29.7 wt%. In addition, the resulting cream cheese-like food had an insufficient baking resistance such as a height decrease 25 rate after baking of 67%.

[0037]

[Comparative Example 2]

22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase.

5 Separately, 45.6 parts of water was warmed to about 30°C, and 20 parts of skim milk powder, 12 parts of total milk protein, and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase.

10 The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type
15 emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 95.8
20 parts of this fermented milk were added 1.9 parts of corn-derived crosslinked starch, 1.4 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent and 0.05 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized
25 under a pressure of 10 MPa, the homogenate was filled into

a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 16.2 wt%, the amount of the cross linked starch was 3.4 wt% (of this amount, the amount of the rice-derived crosslinked starch was 1.4 wt%), the amount of the fat and oil was 21.3 wt%, and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food had a sufficient baking resistance such as a height decrease rate after baking of 8%, but was a hard crumbly structure, and had poor handling properties and bad texture.

[0038]

[Comparative Example 3]

32 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase. Separately, 49.6 parts of water was warmed to about 30°C, and 15 parts of skim milk powder, 3 parts of total milk protein and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and

rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 98.4 parts of this fermented milk were added 0.4 part of corn-derived crosslinked starch, 0.4 part of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent, and 0.05 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 7.7 wt%, the amount of the crosslinked starch was 0.8 wt% (of this amount, the amount of the rice-derived crosslinked starch was 0.4 wt%), the amount of the fat and oil was 31.6 wt%, and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food had an insufficient baking resistance such as a height decrease rate after baking of 58%, and had oily flavor, and therefore, it was defect.

[0039]

[Comparative Example 4]

9 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase. Separately, 72.6 parts of water was warmed to about 30°C, and 15 parts of skim milk powder, 3 parts of total milk protein and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 4.9. Subsequently, after heat sterilization at 80°C for 30 minutes, to 87.8 parts of this fermented milk were added 6.1 parts of corn-derived crosslinked starch, 5.3 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.4 part of pH adjusting agent, and 0.04 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10 MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like

food. In the obtained cream cheese-like food, the amount of the protein was 6.9 wt%, the amount of the crosslinked starch was 11.4 wt% (of this amount, the amount of the rice-derived crosslinked starch was 5.3 wt%), the amount of the fat and oil was 8.1 wt%, and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food had a sufficient baking resistance such as a height decrease rate after baking of 8%, but was a hard crumbly structure, and had poor handling properties and a bad texture.

[0040]

[Comparative Example 5]

22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase.

Separately, 69.6 parts of water was warmed to about 30°C, and 5 parts of skim milk powder, 3 parts of total milk protein, and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase.

The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was

added 1 part of a lactic acid bacterium bulk starter for cheese, and fermentation was performed at 20°C for 15 hours to obtain fermented milk having a pH of 5.1. Subsequently, after heat sterilization at 80°C for 30 minutes, to 95.8 parts of this fermented milk were added 1.9 parts of corn-derived crosslinked starch, 1.4 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent and 0.05 part of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10 MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 4.3 wt%, the amount of the crosslinked starch was 3.4 wt% (of this amount, the amount of the rice-derived crosslinked starch was 1.4 wt%), the amount of the fat and oil was 21.3 wt%, and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food was excellent in handling properties, but had an insufficient baking resistance such as a height decrease rate after baking of 62%.

[0041]

[Comparative Example 6]

22 parts of rapeseed palm mixed hardened oil (melting point 31°C) was warmed to 60°C to prepare an oil phase.

Separately, 59.6 parts of water was warmed to about 30°C, and 15 parts of skim milk powder, 3 parts of total milk protein and 0.4 part of egg white powder which had been mixed in a form of a powder were gradually added while stirring with a Homomixer, to prepare an aqueous phase. The oil phase was added to the aqueous phase, the mixture was pre-emulsified at 70°C for 30 minutes, thereafter, the emulsion was subjected to sterilization, and then homogenized with a homogenizer under a pressure of 5MPa and rapidly cooled to 20°C to prepare an oil in water type emulsion. To the obtained oil in water type emulsion was added a suitable amount of 50% lactic acid to obtain an oil in water type emulsion having a pH of 4.9. After the emulsion was subjected to heat sterilization at 80°C for 30 minutes, to 95.8 parts of this oil in water type emulsion were added 1.9 parts of corn-derived crosslinked starch, 1.4 parts of rice-derived crosslinked starch, 0.3 part of dietary salt, 0.5 part of pH adjusting agent and 0.05 parts of flavor, the mixture was kneaded at 80°C for 10 minutes, and further, homogenized under a pressure of 10 MPa, the homogenate was filled into a plastic film tube, and the tube was sealed and rapidly cooled to 5°C to obtain a cream cheese-like food. In the obtained cream cheese-like food, the amount of the protein was 7.6 wt%, the amount of the crosslinked starch was 3.4 wt% (of this amount, the amount

of the rice-derived crosslinked starch was 1.4 wt%), the amount of the fat and oil was 21.3 wt%, and the amount of the egg white-derived protein was 0.3 wt%. In addition, the resulting cream cheese-like food had a sufficient baking resistance such as a height decrease rate after baking of 15%, but had bad taste which is sharp stimulating flavor and less rich body since it did not undergo a fermentation step.

[0042]

Results of Examples 1 to 8 are shown in Table 1, and results of Comparative Examples 1 to 6 are shown in Table 2.

[0043]

Table 1

[illegible]

[0044]

Table 2

		Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4	Comparative Example 5	Comparative Example 6	
Fermented milk (*Comparative Example 6 is unfermented)	Vegetable fat	18	22	32	9	22	22	
	Unsalted butter	15						
	Skim milk powder	10	20	15	15	5	15	
	Total milk protein		12	3	3	3	3	
	Egg white powder		0.4	0.4	0.4	0.4	0.4	
	Water	57	45.6	49.6	72.6	69.6	59.6	
	Bulk starter	1	1	1	1	1	* unfemented suitable amount	
	Lactic acid							
Emulsifying agent		0.1						
Formulation	Fermented milk	98.9	95.8	98.4	87.8	95.8	95.8	
	Corn-derived crosslinked starch	1.0	1.9	0.4	6.1	1.9	1.9	
	Rice-derived crosslinked starch		1.4	0.4	5.3	1.4	1.4	
	Dietary salt	0.1	0.3	0.3	0.3	0.3	0.3	
	pH adjusting agent		0.5	0.5	0.4	0.5	0.5	
Flavor		0.05	0.05	0.05	0.04	0.05	0.05	
Composition	Protein	3.3	16.2	7.7	6.9	4.3	7.6	
	Crosslinked starch	1.0	3.4	0.8	11.4	3.4	3.4	
	Fat	29.7	21.3	31.6	8.1	21.3	21.3	
	Egg white-derived protein		0.3	0.3	0.3	0.3	0.3	
	Rice or tapioca-derived crosslinked starch		1.4	0.4	5.3	1.4	1.4	
Quality evaluation	Height before baking	1.2 cm	1.2 cm	1.2 cm	1.3 cm	1.3 cm	1.3 cm	
	Height after baking	0.4 cm	1.1 cm	0.5 cm	1.2 cm	0.5 cm	1.1 cm	
	Height decrease rate	67%	8%	58%	8%	62%	15%	
	Flavor	○ Refreshing sourness like a natural cheese	×	△ Oily	×	○ Refreshing sourness like a natural cheese	×	Sharp stimulating flavor, less rich body
	Texture	○ Soft texture and smooth melting in mouth	×	○ Soft texture and smooth melting in mouth	×	○ Soft texture and smooth melting in mouth	○	

CLAIMS

1. A cream cheese-like food comprising fermented milk prepared by lactic acid-fermentation of an oil-in water type emulsion containing a milk material, fat or oil, and water, wherein the cream cheese-like food comprises 5 to 15 wt% of protein, 1 to 10 wt% of crosslinked starch and 10 to 30 wt% of fat or oil.

2. The cream cheese-like food according to claim 1, wherein the cream cheese-like food comprises 0.1 to 2 wt% of protein derived from egg white.

3. The cream cheese-like food according to claim 1, wherein the cream cheese-like food comprises 0.5 to 5 wt% of crosslinked starch derived from rice and/or tapioca.