

DESCRIPTION

Title of Invention

PLASTIC EMULSIFIED OIL/FAT COMPOSITION FOR KNEADING IN BAKERY PRODUCTS

5

Technical Field

[0001]

The present invention relates to a plastic emulsified oil and/or fat (hereinafter referred to as oil/fat) composition for kneading in bakery products, more specifically
10 relates to a plastic emulsified oil/fat composition for kneading in bakery products, which can provide a bakery dough having fine physical properties in the case when wheat flour having a high ash content such as second class flour is used, and can provide a bakery product having an equivalent quality to that of a bakery product using wheat flour having a small ash content.

15 Background Art

[0002]

Wheat flour used for bakery product making is mainly obtained by pulverizing the endosperm parts of wheat particles to form a powder, but it is very difficult to separate the endosperm parts since they are strongly bound to the germs and outer coats.
20 Therefore, when wheat flour is formed into a product, wheat particles are first pulverized, the endosperm parts are separated from the parts containing the outer coats and germs, the endosperm parts are directly used as wheat flour, the parts containing the outer coats and germs are further subjected to several steps of pulverization and separation, and wheat flour is similarly obtained from the obtained endosperm parts,

and finally, operations of pulverization and separation are conducted until most of the outer coats and germs are removed.

[0003]

The wheat flour obtained by the first separation incorporates small amounts of germs and outer coats, and the wheat flour obtained by the later separation is wheat flour incorporating larger amounts of outer coats and germs. Since the outer coats and germs contain much misplaced materials other than starch and gluten protein, the obtained wheat flour has a high ash content, a dingy color, a high enzyme activity that leads to deterioration of quality, a rough average particle diameter, and a high content of damaged starch particles.

[0004]

Therefore, in the case of the production of bakery products, a bakery product in which the wheat flour obtained by the later separation, i.e., wheat flour having a high ash content, had problems that it had an appearance such that the crust had a reddish-brown color, a small volume, a rough and inhomogeneous inner phase, a dingy color, and bad flavor such as steamy smell, and is deteriorated fast, as compared to a bakery product mainly using the wheat flour obtained by the first separation, i.e., the wheat flour having a small ash content.

[0005]

Furthermore, the wheat flour obtained by the later separation had a problem also in the stage of a bakery dough that the bakery dough is difficult to be handled since the bakery dough contained much damaged starch and thus easily becomes gooey, and

the gluten as generated had strong elasticity, low stickiness and brittleness, and thus the bakery dough had bad extensibility, and the like.

Furthermore, such wheat flour obtained by the later separation having a high ash content was referred to as second class flour, and had a problem that it cannot be used for bakery product making, specifically for the production of high-grade bakery products for which flavor is emphasized.

[0006]

Therefore, various methods for obtaining a bakery dough having fine physical properties even in the case when such wheat flour is used, and for obtaining a bakery product having an equivalent quality to that of a bakery product in which wheat flour having a small ash content is used, have been devised.

[0007]

Some methods for modifying wheat flour are suggested to obtain wheat flour having an equivalent quality to that of wheat flour having a low ash content while it contains a fraction having a high ash content in flour milling.

One of such method is subjecting wheat flour to a heat-moisture treatment (for example, see Patent Literature 1). However, although it is possible to resolve the problems caused by starch, but the problems caused by ash cannot be resolved by this method, and thus a bakery dough and a bakery product having fine qualities are not able to be obtained.

[0008]

Another method is conducting flour milling so that wheat flour does not contain a bran component (for example, see Patent Literature 2). However, since this method is a special flour milling method, there are problems that mass production is impossible, and that effects of improving problems other than the flavor of a bakery product (the physical properties of a dough, the inner phase and appearance of the bakery product, and the like) cannot be obtained.

[0009]

Still other methods are using a fraction of wheat flour (for example, see Patent Literatures 3 and 4). However, these methods are methods adding wheat flour containing much ash such as second class flour to general wheat flour to adjust the particle size to a specific range. Therefore, these methods are not methods for obtaining a fine bakery product by using second class flour itself, and the obtained bakery dough and bakery product are inferior to the bakery dough and bakery product obtained from only wheat flour having a small ash content.

[0010]

Accordingly, although it is possible to improve the physical properties of a bakery dough to the some extent by the conventional methods for directly modifying wheat flour, a bakery dough and a bakery product having sufficiently fine qualities are not able to be obtained.

[0011]

On the other hand, it is suggested to use an emulsified oil/fat composition containing proteinase, a glycerin organic acid fatty acid ester, an oxidizing agent and a

gelatinization swelling-suppressed starch in producing a bakery product directly using wheat flour having a high ash content (for example, see Patent Literature 5). However, in this method, the obtained bakery product loses its shape when toasted, and the bakery product has insufficient moist feeling while having fine tenderness.

5 [0012]

Furthermore, a method for improving the texture of a bakery product in which general wheat flour is used, by using various components for improving bakery product making such as glucomannan, which is a main component of polysaccharides included in, for example, konjac root, is attempted, so as to increase the volume, or impart moist
10 feeling and aging resistance (for example, see Patent Literatures 6 and 7). Glucomannan has properties such as high stickiness, high water retention property and gel formability, and when glucomannan is used in bakery products, effects such as prevention of aging by improving water retention property, and imparting of moist feeling are expected.

15 [0013]

However, in the case when glucomannan is added to a bakery dough in the state of a powder, there are problems that it is difficult to homogeneously disperse the glucomannan, and that the bakery dough is hardened over time. Furthermore, the method in which glucomannan is added after gelation has a problem that the bakery
20 dough easily becomes tacky unless the concentration of the glucomannan in the gel is increased, and a problem that the texture becomes strongly sticky when the amount of the glucomannan is conversely increased.

[0014]

Furthermore, in the methods described in Patent Literatures 6 and 7, the components and the content ratios of the components thereof are preset so that a high effect would be obtained in the cases when they are used for wheat flour having a small ash content. Therefore, the above-mentioned problems cannot be resolved in the case when wheat flour having a high ash content is used. Further, the obtained bakery dough rather becomes tacky, and the bakery product making workability is deteriorated, the volume of the bakery product is decrease. Thus, a bakery dough and a bakery product having fine qualities are not be able to be obtained.

10 Citation List

Patent Literature

[0015]

Patent Literature 1: JP 2007-125006 A

Patent Literature 2: JP 2008-148601 A

15 Patent Literature 3: JP 2004-147549 A

Patent Literature 4: JP 2005-168451 A

Patent Literature 5: JP 2010-200696 A

Patent Literature 6: JP 2003-116450 A

Patent Literature 7: JP 2006-320207 A

20 Summary of Invention

Technical Problem

[0016]

Accordingly, the present invention aims at providing a plastic oil/fat composition for kneading in bakery products, which can provide a bakery dough having fine physical properties even in the case when wheat flour having a high ash content is used, and can further provide a bakery product having an equivalent quality to that of a bakery product using wheat flour having a small ash content is used.

Solution to Problem

[0017]

The present inventors did various studies so as to achieve the above-mentioned aim, and consequently found that a plastic emulsified oil/fat composition containing glucomannan and an emulsifier in combination under a specific condition can resolve the above-mentioned problems of the prior art.

[0018]

The present invention is made in view of the above circumstance and provides a plastic emulsified oil/fat composition for kneading in bakery products, containing glucomannan and a glycerol mono-fatty acid ester in an aqueous phase.

[0019]

Furthermore, the present invention provides bakery dough using the plastic emulsified oil/fat composition for kneading in bakery products.

Furthermore, the present invention provides a method for producing the plastic emulsified oil/fat composition for kneading in bakery products including mixing an oil phase, and an aqueous phase or oil-in-water type emulsified product containing a glucomannan and a glycerol mono-fatty acid ester.

Advantageous Effects of Invention

[0020]

When the plastic emulsified oil/fat composition for kneading in bakery products of the present invention is used, even in the case when wheat flour having a high ash content such as second class flour is used, the obtained bakery dough is not sticky and has fine extensibility, and a bakery product obtained by using the bakery dough has an appearance with crust having a fine burnt color and a large volume, has an inner phase that has vertical streaks and is homogeneous, has an improved color tone in the inner phase, has fine flavor without steamy smell, has fine moist feeling and crispy touch, and is excellent in aging resistance.

Description of Embodiments

[0021]

Hereinafter the plastic emulsified oil/fat composition for kneading in bakery products of the present invention will be explained in detail.

The plastic emulsified oil/fat composition for kneading in bakery products of the present invention contains (1) glucomannan and (2) a glycerol mono-fatty acid ester in an aqueous phase.

[0022]

First, the above-mentioned glucomannan (1) will be mentioned.

Glucomannan is a composite polysaccharide (a non-digestible polysaccharide), which is included in the tuber of edible konjac, and is constituted by large numbers of D-glucose and D-mannose that are bound by β -1,4-bonds at a molar ratio of

approximately 1:1.6. The molecular weight thereof is about 1,000,000 to 2,000,000, but differs depending on the production region, breed and the like. The physical properties thereof are excellent affinity for water and very strong water retention ability. Furthermore, glucomannan has been conventionally used as a thickening agent, and is
5 known to have a specifically high viscosity among thickening agents.

[0023]

The above-mentioned glucomannan (1) is included in the plastic emulsified oil/fat composition by a content of preferably 0.01 to 2.1 mass%, further preferably 0.03 to 1.1 mass%, and even more preferably 0.04 to 0.4 mass%, with respect to the mass of
10 the plastic emulsified oil/fat composition. When the content is less than 0.01 mass%, it is not preferable since the effect of the present invention becomes very low. Alternatively, when the content is more than 2.1 mass%, it is not preferable since the finally obtained bakery product gives strongly tacky and sticky texture.

[0024]

15 Furthermore, in the plastic emulsified oil/fat composition, the above-mentioned glucomannan (1) is included preferably by 0.021 to 15 mass%, further preferably by 0.04 to 10 mass%, even more preferably by 0.1 to 5 mass% with respect to the mass of the aqueous phase. When the content with respect to the mass of the aqueous phase is less than 0.021 mass%, the glucomannan content in the plastic emulsified oil/fat
20 composition is also suppressed to be low, and thus the effect of the present invention becomes very weak. When the content with respect to the mass of the aqueous phase is more than 15 mass%, it is not preferable since the workability is deteriorated, for

example, the viscosity becomes too high, the production of margarine becomes difficult, and the like.

[0025]

The amount of the aqueous phase (mass%) in the plastic emulsified oil/fat composition can be measured by the following method.

First, the plastic emulsified oil/fat composition for kneading in bakery products is heated to 60 to 65°C to thereby completely dissolve the composition. Thereafter the oil phase is removed from the above-mentioned dissolved emulsified oil/fat composition, and the residual amount is defined as the amount of the above-mentioned aqueous phase (mass%).

The above-mentioned aqueous phase refers to an aqueous phase constituted by water and a water-soluble component.

[0026]

In order to incorporate the above-mentioned glucomannan (1) into the plastic emulsified oil/fat composition, glucomannan-containing materials such as purified glucomannan, and a konjac powder or simply-purified konjac powder can be used. These glucomannan-containing materials are preferably used so as to satisfy the above-mentioned glucomannan content. These glucomannan-containing materials each has a purity of preferably 50 mass% or more, more preferably 60 mass% or more. A konjac powder or the like containing glucomannan with a purity of lower than 50 mass% is not preferable since astringent taste remains and flavor is easily lost. As impurity components other than glucomannan in the above-mentioned glucomannan-containing material may include, for example, starches, oxalic acid and

potassium oxalate, and may also include ash components such as calcium, potassium, sodium, magnesium and phosphorus.

[0027]

Next, the above-mentioned glycerol mono-fatty acid ester (2) will be mentioned.

In general bakery product making, an emulsifier such as a glycerol mono-fatty acid esters strongly binds to starch in a bakery dough to form a composite to thereby suppress the swelling of the starch. As a result, excess water is used for the generation of a gluten structure, and thus a firm gluten structure with fine extensibility is formed. Thus, an emulsifier is used aiming at improving the physical properties of a dough, increasing the volume of the obtained bakery product, and obtaining soft texture. However, in the case when wheat flour having a high ash content is used, the ratio of gliadin is high and the elasticity is strong, and thus a fine gluten structure cannot be obtained even if much moisture is fed.

[0028]

Even in the case when wheat flour having a high ash content is used, when the above-mentioned glycerol mono-fatty acid ester (2) is incorporated together with the above-mentioned glucomannan (1) in the aqueous phase of the plastic emulsified oil/fat composition as in the present invention, a fine gluten structure is formed, and consequently a bakery dough having fine physical properties can be obtained, and a fine quality bakery product can be obtained.

Since glycerol mono-fatty acid esters are oil-soluble, they are generally dissolved in an oil phase when they are used in an emulsified oil/fat composition.

However, in the present invention, a synergistic effect with glucomannan cannot be obtained unless incorporating the glycerol mono-fatty acid ester in the aqueous phase.

[0029]

As the glycerol mono-fatty acid ester used in the present invention, a known glycerol mono-fatty acid ester can be used. Although either a saturated fatty acid or an unsaturated fatty acid can be used as the fatty acid in the glycerol mono-fatty acid ester, a saturated fatty acid is preferable from the viewpoint that the effect of the present invention is increased. Although the chain length of the fatty acid is also not limited, it is preferably 8 to 26, more preferably 12 to 24, further preferably 16 to 22.

[0030]

The present invention is characterized in that the glycerol mono-fatty acid ester is incorporated in the aqueous phase rather than the oil phase. Meanwhile, in the present invention, the glycerol mono-fatty acid ester may be incorporated in not only the aqueous phase but also the oil phase.

[0031]

In order to stably disperse the glycerol mono-fatty acid ester in the aqueous phase, it is preferable to use a water-dispersion type glycerol mono-fatty acid ester. Examples of the water-dispersion type glycerol mono-fatty acid ester may include a powder type glycerol mono-fatty acid ester obtained by preparing an aqueous solution in which a composite of a glycerol mono-fatty acid ester and a polymer substance such as casein sodium is formed, and spray drying the solution. Examples of the water-dispersion type glycerol mono-fatty acid ester may also include a hydrate type

glycerol mono-fatty acid ester with a sliced micelle structure in which hydrophilic groups are directed outward. It is preferable to use a hydrate type glycerol mono-fatty acid ester in the present invention.

[0032]

5 Alternatively, it is also possible to use a glycerol mono-fatty acid ester that is not of a water-dispersion type, and in such case, the glycerol mono-fatty acid ester that is not of a water-dispersion type can be converted to a hydrate type by adding the glycerol mono-fatty acid ester to the aqueous phase, and heating the aqueous phase to 10 50 to 70°C. In this case, it is necessary to adjust the pH of the aqueous phase to 5 or less so as to stabilize the hydrate type, and it is further preferable to adjust the pH to 3 to 5. For the adjustment of the pH, organic acids such as citric acid and malic acid, inorganic acid salts such as sodium phosphate, organic acid salts such as sodium citrate, and the like can be used.

[0033]

15 The content of the glycerol mono-fatty acid ester (2) in the aqueous phase of the plastic emulsified oil/fat composition is preferably 0.5 to 14 mass%, further preferably 1.0 to 9.5 mass%, even more preferably 2.0 to 5.5 mass% with respect to the mass of the plastic emulsified oil/fat composition. When the content is less than 0.5 mass%, the effect of the present invention cannot be sufficiently obtained, whereas 20 when the content is more than 14 mass%, it is not preferable since astringent taste derived from the emulsifier is felt.

[0034]

The content of the glycerol mono-fatty acid ester in the aqueous phase of the plastic emulsified oil/fat composition for kneading in bakery products (mass%, with respect to the mass of the plastic emulsified oil/fat composition) can be measured by the following method.

5 First, the plastic emulsified oil/fat composition for kneading in bakery products is completely dissolved at 60 to 65°C, and the oil phase is removed from the dissolved emulsified oil/fat composition, and only the aqueous phase part is completely dried at 100 to 110°C. The lipid component included in the dried aqueous phase part is analyzed by gas chromatography, and the monoglyceride is quantified.

10 [0035]

Furthermore, the content of the above-mentioned glycerol mono-fatty acid ester (2) in the aqueous phase of the plastic emulsified oil/fat composition is preferably 1 to 50 mass%, further preferably 5 to 45 mass%, even more preferably 10 to 40 mass% with respect to the mass of the aqueous phase. When the content of the
15 above-mentioned glycerol mono-fatty acid ester (2) is lower than 1 mass%, the effect of the present invention becomes poor. When the content exceeds 50 mass%, the viscosity becomes too high, the emulsification stability is easily decreased, and the obtained bakery product may have sticky texture and bad melt-in-the-mouth.

[0036]

20 Furthermore, the content of the glycerol mono-fatty acid ester, which includes the content of the glycerol mono-fatty acid ester not only in the aqueous phase but also in the oil phase, is preferably 0.1 to 15 mass%, further preferably 1.5 to 10 mass%, even more preferably 2 to 7 mass% in the plastic emulsified oil/fat composition. When the

glycerol mono-fatty acid ester is incorporated in this range, a bakery product having fine moist feeling can be obtained more surely.

[0037]

Although it is unclear why a significant effect appears by incorporating the glucomannan and glycerol mono-fatty acid ester in the aqueous phase in the present invention, the reason is presumed as follows.

Glycerol mono-fatty acid esters are generally excellent in aging-preventing effect, but have a disadvantage that they have bad dispersibility in water and thus are difficult to exert the performances. In the present invention, it is considered that the effect of the present invention is exerted since the glycerol mono-fatty acid ester can effectively act even in the aqueous phase, and the various functions possessed by the glucomannan are maximally brought out, by incorporating the glycerol mono-fatty acid ester together with the glucomannan in the aqueous phase.

[0038]

The plastic emulsified oil/fat composition for kneading in bakery products of the present invention contains an oil and/or fat (oil/fat). Examples of the oil/fat may include various vegetable oils and fats and animal oils and fats such as palm oil, palm kernel oil, coconut oil, corn oil, cottonseed oil, soybean oil, rapeseed oil, rice oil, sunflower seed oil, safflower oil, olive oil, canola oil, beef tallow, milk fat, lard, cacao fat, fish oil and whale oil, and processed oils and fats obtained by subjecting these oils and fats to one or two or more treatment(s) selected from hydrogenation, separation and transesterification. These oils and fats can be used alone, or by combining two or more kinds.

[0039]

It is preferable that the plastic emulsified oil/fat composition contains a direct β -form oil/fat crystal in the oil phase. If the direct β -form oil/fat crystal is not contained, a plastic emulsified oil/fat composition having fine crystal stability may be difficult to be obtained, and kneading may be insufficient during the operations of bakery product making.

However, in the present invention, an oil/fat crystal that is not a direct β -form oil/fat crystal such as a β -prime form oil/fat crystal may be contained as long as the direct β -form oil/fat crystal is contained.

[0040]

The above-mentioned direct β -form oil/fat crystal refers to an oil/fat crystal that directly transforms from an α -form crystal that is unstable in terms of heat energy to a β -form crystal that is the most stable form without going through a β -prime form that is a semi-stable form, when the oil/fat crystal is molten, cooled and crystallized. At this time, the crystallization condition may be any crystallization condition, and a special heat treatment such as tempering is not required.

[0041]

In the present invention, the method for ascertaining whether the oil/fat crystal is a direct β -form may include, for example, a method in which the oil/fat crystal is completely molten at 70°C, retained at 0°C for 30 minutes, and retained at 5°C for 30 minutes to give an oil/fat crystal, and ascertaining whether the obtained oil/fat crystal is a β -form crystal.

[0042]

The method for ascertaining whether the above-mentioned oil/fat crystal is a β -form crystal may include, for example, a method of measuring a short spacing as follows in an X-ray diffractometry.

5 Specifically, the short spacing of an oil/fat crystal is measured in the range of 2θ : 17 to 26°, and in the case when a strong diffraction peak corresponding to a spacing at 4.5 to 4.7 angstrom is shown, the oil/fat crystal is judged as a β -form crystal. In the case when the measurement is conducted at a higher accuracy, the short spacing is measured in the range of 2θ : 17 to 26°, a peak intensity (peak intensity 1) having the maximum value in the range corresponding to the spacing at 4.5 to 4.7 angstrom and a
10 peak intensity (peak intensity 2) having the maximum value in the range corresponding to the spacing at 4.2 to 4.3 angstrom are taken, and in the case when the ratio of peak intensity 1/peak intensity 2 becomes 1.3 or more, preferably 1.7 or more, more preferably 2.2 or more, even more preferably 2.5 or more, the oil/fat crystal is judged as
15 a β -form crystal.

[0043]

Furthermore, it is preferable that the packing state of the triglyceride molecule in the above-mentioned direct β -form oil/fat crystal has a two-chain length structure. As a method for ascertaining that the oil/fat crystal has a two-chain length structure, for
20 example, a method by an X-ray diffractometry may be exemplified.

Specifically, the long spacing of an oil/fat crystal is measured in the range of 2θ : 0 to 8°, and in the case when a diffraction peak corresponding to 40 to 50 angstrom is shown, the oil/fat crystal is judged to have a two-chain length structure.

[0044]

In the plastic emulsified oil/fat composition of the present invention, the content of the above-mentioned direct β -form oil/fat crystal is preferably 5 mass% or more, more preferably 5 to 50 mass%, further preferably 5 to 30 mass%, even more preferably 5 to 20 mass% in the oil phase with respect to the mass of the oil phase. If the content of the direct β -form oil/fat crystal is lower than 5 mass% in the oil phase of the plastic emulsified oil/fat composition, a β -form crystal having a size exceeding 20 μm easily appears over days, and the composition is easily harden over days. As a result, kneading easily becomes insufficient during the operations of bakery product making.

The above-mentioned oil phase refers to at least one oil/fat to which an emulsifier, a colorant, a antioxidant, a flavoring material, a seasoning and the like are added as necessary. Furthermore, the above-mentioned oil/fat also includes fatty components extracted from food materials such as milk products, fruits, fruit juices, coffee, nut pastes, spices, cacao mass, cocoa powder, grains, beans, vegetables, meats and sea foods. Furthermore, the above-mentioned oil/fat includes oils and fats containing S_1MS_2 and oils and fats containing MS_3M mentioned below, besides the various vegetable oils and fats, animal oils and fats and processed oils and fats and the like listed above as the oils and fats included in the plastic emulsified oil/fat composition for kneading in bakery products.

[0045]

Examples of the direct β -form oil/fat crystal in the present invention will be exemplified.

Examples of the above-mentioned direct β -form oil/fat crystal may include a compound crystal composed of a triglyceride represented by S_1MS_2 (S_1 and S_2 each represents a saturated fatty acid, and M represents a monounsaturated fatty acid) (hereinafter referred to as S_1MS_2) and a triglyceride represented by MS_3M (S_3 represents a saturated fatty acid, and M represents a monounsaturated fatty acid) (hereinafter referred to as MS_3M).

The above-mentioned compound crystal composed of S_1MS_2 and MS_3M shows crystallization behavior as if it is a single triglyceride molecule when one molecule of S_1MS_2 and one molecule of MS_3M having different structures are mixed. The compound crystal also called as an intermolecular compound.

[0046]

S_1 and S_2 in S_1MS_2 and S_3 in MS_3M mentioned above are each preferably a saturated fatty acid having 16 or more carbon atoms, further preferably palmitic acid, stearic acid, arachidic acid or behenic acid. Furthermore, it is even more preferable that the above-mentioned S_1 , S_2 and S_3 are the same saturated fatty acid in the present invention.

Furthermore, M in S_1MS_2 and M in MS_3M mentioned above is preferably a monounsaturated fatty acid having 16 or more carbon atoms, further preferably a monounsaturated fatty acid having 18 or more carbon atoms, even more preferably oleic acid.

[0047]

In the plastic emulsified oil/fat composition for kneading in bakery products of the present invention, the above-mentioned compound crystal composed of S_1MS_2 and

MS₃M is incorporated so as to be preferably 5 mass% or more, more preferably 5 to 50 mass%, further preferably 5 to 30 mass%, even more preferably 5 to 20 mass% with respect to the mass of the oil phase in the oil phase of the plastic emulsified oil/fat composition.

5 In addition, in the plastic emulsified oil/fat composition for kneading in bakery products of the present invention, the content of the above-mentioned compound crystal composed of S₁MS₂ and MS₃M can be deemed to be twice as the smaller content of the contents of S₁MS₂ and MS₃M.

[0048]

10 Furthermore, the content of the above-mentioned S₁MS₂ in the oil phase of the plastic emulsified oil/fat composition is preferably 2.5 mass% or more, more preferably 2.5 to 25 mass%, further preferably 2.5 to 15 mass%, even more preferably 2.5 to 10 mass%, with respect to the mass of the oil phase. The content of the above-mentioned MS₃M in the oil phase is preferably 2.5 mass% or more, more preferably 2.5 to 25
15 mass%, further preferably 2.5 to 15 mass%, even more preferably 2.5 to 10 mass%, with respect to the mass of the oil phase.

[0049]

 Furthermore, in the plastic emulsified oil/fat composition of the present invention, S₁MS₂ and MS₃M are incorporated so that the molar number of S₁MS₂/ the
20 molar number of MS₃M would become preferably 0.4 to 7, further preferably 0.8 to 5.

[0050]

In order to incorporate a compound crystal composed of S_1MS_2 and MS_3M preferably at the above-mentioned range in the plastic emulsified oil/fat composition, an oil/fat containing S_1MS_2 and an oil/fat containing MS_3M may be mixed and used in the present invention.

5 [0051]

Examples of the above-mentioned oil/fat containing S_1MS_2 can includes various vegetable oils and fats such as palm oil refined by distillation, generally refined palm oil, cacao butter, shea butter, mango kernel oil, sal butter, illipe butter, kokum butter, dhupa butter, mowrah butter, phulwara butter and Chinese tallow, processed oils
10 and fats obtained by separating these various vegetable oils and fats, and the transesterified oils described below and processed oils and fats obtained by fractionating the transesterified oils can be used. In the present invention, one kind or two or more kinds selected from these.

The above-mentioned transesterified oils may include transesterified oils that
15 are produced by using various animal and vegetable oils and fats such as palm oil refined by distillation, generally-refined palm oil, palm kernel oil, coconut oil, corn oil, olive oil, cottonseed oil, soybean oil, rapeseed oil, rice oil, sunflower seed oil, safflower oil, beef tallow, milk fat, lard, cacao butter, shea butter, mango kernel oil, sal butter, illipe butter, fish oil and whale oil, and processed oils, fatty acids, fatty acid lower
20 alcohol esters that are obtained by hydrogenating and/or fractionating these various animal and vegetable oils and fats.

[0052]

Examples of the above-mentioned oil/fat containing MS_3M can includes lard, fractionated lard and the transesterified oils mentioned below can be used, and one kind or two or more kinds selected from these, in the present invention.

The above-mentioned transesterified oils may include transesterified oils that are produced by using various animal and vegetable oils and fats such as palm oil refined by distillation, generally-refined palm oil, palm kernel oil, coconut oil, corn oil, olive oil, cottonseed oil, soybean oil, rapeseed oil, rice oil, sunflower seed oil, safflower oil, beef tallow, milk fat, lard, cacao butter, shea butter, mango kernel oil, sal butter, illipe butter, fish oil and whale oil, and processed oils, fatty acids and fatty acid lower alcohol esters that are obtained by hydrogenating and/or fractionating these various animal and vegetable oils and fats.

[0053]

The above-mentioned oil/fat containing S_1MS_2 is included so that S_1MS_2 would be preferably 2.5 mass% or more, more preferably 2.5 to 25 mass%, further preferably 2.5 to 15 mass%, even more preferably 2.5 to 10 mass% with respect to the mass of the oil phase in the oil phase of the plastic emulsified oil/fat composition. The above-mentioned oil/fat containing MS_3M is included so that MS_3M would be preferably 2.5 mass% or more, more preferably 2.5 to 25 mass%, further preferably 2.5 to 15 mass%, even more preferably 2.5 to 10 mass% with respect to the mass of the oil phase in the oil phase of the plastic emulsified oil/fat composition.

[0054]

Here, methods for ascertaining whether a certain plastic emulsified oil/fat composition contains a direct β -form oil/fat crystal will be mentioned.

The first method is analyzing the triglyceride composition of the oil phase of the plastic emulsified oil/fat composition, measuring the contents of the triglycerides to be the direct β -form oil/fat crystal such as S_1MS_2 and MS_3M in the oil phase, and ascertaining that the triglycerides to be the direct β -form oil/fat crystal are contained in the oil phase, preferably that the contents thereof are within the above-mentioned ranges, to thereby ascertain that the plastic emulsified oil/fat composition contains the direct β -form oil/fat crystal.

[0055]

Furthermore, the second method is ascertaining that an oil/fat containing the above-mentioned triglycerides to be the direct β -form oil/fat crystal such as S_1MS_2 and MS_3M is contained in the oil phase, preferably that the above-mentioned S_1MS_2 and MS_3M are incorporated in the oil phase so as to be within the above-mentioned ranges.

[0056]

The third method, that is an easier method, is ascertaining that an oil/fat crystal that is obtained when the oil phase of a certain plastic emulsified oil/fat composition is completely molten at 70°C, retained at 0°C for 30 minutes and retained at 5°C for 30 minutes is a β -form crystal having a two chain length structure.

[0057]

In the third method, in the case when that the oil/fat crystal of the oil phase in the plastic emulsified oil/fat composition is a microcrystal, whether the direct β -form oil/fat crystal is contained can be ascertained by ascertaining that the oil/fat crystal obtained when the oil phase is completely molten at 70°C, retained at 0°C for 30 minutes

and retained at 5°C for 7 days is a β -form crystal having a two chain length structure. The above-mentioned microcrystal refers to an oil/fat crystal having a size of preferably 20 μm or less, further preferably 10 μm or less, even more preferably 3 μm or less. The above-mentioned size represents the length of the maximum site of the crystal.

5 [0058]

In this case, it is preferable that the oil/fat crystal obtained when the oil phase is retained at 5°C for 7 days is a β -form crystal having a two-chain length structure, and it is further preferable that the oil/fat crystal obtained when the oil phase is retained at 5°C for 4 days is a β -form crystal having a two-chain length structure, it is further preferable that the oil/fat crystal obtained when the oil phase is retained at 5°C for 1 day is a β -form crystal having a two-chain length structure, it is further more preferable that the oil/fat crystal obtained when the oil phase is retained at 5°C for 1 hour is a β -form crystal having a two-chain length structure, and it is even more preferable that the oil/fat crystal obtained when the oil phase is retained at 5°C for 30 minutes is a β -form crystal having a two-chain length structure.

In the above-mentioned third method, the higher the content of the direct β -form oil/fat crystal in the plastic emulsified oil/fat composition is, the more the obtained oil/fat crystal becomes a β -form crystal having a two chain length structure, even the retention time at 5°C is short.

20 [0059]

In the above-mentioned third method, as the method for judging whether the oil/fat crystal obtained after the retention period at 5°C is a β -form crystal, the judgment

can be conducted by measuring the short spacing in an X-ray diffractometry as mentioned below.

Specifically, the short spacing of the oil/fat crystal is measured in the range of 2θ : 17 to 26°, and in the case when a strong diffraction peak that corresponds to the spacing at 4.5 to 4.7 angstrom is shown, the oil/fat crystal is judged to be a β -form crystal. Furthermore, in the case when the measurement is conducted at a higher accuracy, the short spacing is measured in the range of 2θ : 17 to 26°, a peak intensity (peak intensity 1) having the maximum value in the range corresponding to the spacing at 4.5 to 4.7 angstrom and a peak intensity (peak intensity 2) having the maximum value in the range corresponding to the spacing at 4.2 to 4.3 angstrom are taken, and in the case when the ratio of peak intensity 1/peak intensity 2 becomes 1.3 or more, preferably 1.7 or more, more preferably 2.2 or more, even more preferably 2.5 or more, the oil/fat crystal is judged as a β -form crystal.

[0060]

Furthermore, it is preferable that the packing state of the triglyceride molecule in the oil/fat crystal of the oil phase of the plastic emulsified oil/fat composition has a two-chain length structure. As a method for ascertaining that the triglyceride molecule has a two-chain length structure, for example, a method by an X-ray diffractometry may be exemplified.

Specifically, the long spacing of the oil/fat crystal is measured in the range of 2θ : 0 to 8°, and in the case when a diffraction peak that corresponds to 40 to 50 angstrom is shown, the oil/fat crystal is judged to have a two-chain length structure.

[0061]

The content of the above-mentioned compound crystal composed of S_1MS_2 and MS_3M in the oil phase of the plastic emulsified oil/fat composition (mass%, with respect to the mass of the oil phase) can be measured by the following method. The content of the above-mentioned compound crystal measured by the following method
5 can be deemed to be the content of the direct β -form oil/fat crystal in the oil phase of the plastic emulsified oil/fat composition (mass%, with respect to the mass of the oil phase).

First, the plastic emulsified oil/fat composition is completely dissolved by heating to 60 to 65°C. Thereafter the oil phase is separated from the above-mentioned dissolved emulsified oil/fat composition. For the obtained oil phase, the triglyceride is
10 further quantified by high-speed liquid chromatography or the like, and the composition thereof is analyzed to thereby obtain the respective contents of S_1MS_2 and MS_3M included in the triglyceride. A twice amount of the smaller content of the content of S_1MS_2 and the content of MS_3M is considered to be the content of the compound crystal composed of S_1MS_2 and MS_3M .

15 Here, the amount of the oil phase in the plastic emulsified oil/fat composition (mass%) can be measured by the following method.

First, the plastic emulsified oil/fat composition is completely dissolved by heating to 60 to 65°C. Thereafter the oil phase is separated from the above-mentioned dissolved emulsified oil/fat composition, and the amount thereof is considered to be the
20 amount of the above-mentioned oil phase (mass%).

[0062]

Furthermore, it is preferable that the plastic emulsified oil/fat composition is substantially free from trans acids. Although hydrogenation is a typical method for increasing the melting point of an oil/fat, hydrogenated oils and fats other than

completely hydrogenated oils and fats generally contain about 10 to 50 mass% of trans acids in the constitutional fatty acid. On the other hand, trans acids are present little in natural oils and fats, and they are included by only lower than 10 mass% in oils and fats derived from ruminant animals. In recent years, oil/fat compositions that have not been subjected to a chemical treatment, specifically hydrogenation, i.e., oil/fat compositions that are substantially free from trans acids, and have suitable consistency are also required. As used herein, "substantially free from trans acids" refers to that the trans acids in the whole constitutional fatty acid in the plastic emulsified oil/fat composition are preferably lower than 10 mass%, further preferably 5 mass% or less, more preferably 3 mass% or less, even more preferably 1 mass% or less.

[0063]

The content of the oil/fat in the plastic emulsified oil/fat composition is preferably 51 to 94 mass%, more preferably 55 to 90 mass%, further preferably 60 to 85 mass% with respect to the mass of the composition. If the content of the oil/fat is lower than 51 mass%, the easiness of kneading into a bakery dough (mixing property) when the composition is added to the bakery dough is deteriorated, and the extensibility of the obtained bakery dough may be deteriorated, and in such case, the volume of the obtained bakery product is decreased, and the inner phase, texture, and aging resistance may also be deteriorated. On the other hand, when the content exceeds 94 mass%, stable incorporation of the above-mentioned glucomannan (1) and glycerol mono-fatty acid ester (2) may become difficult. In addition, in the case when sub-raw materials containing oils and fats are used in the plastic emulsified oil/fat composition of the present invention, the oil/fat components included in those sub-raw materials are also included in the above-mentioned content of the oil/fat.

[0064]

The moisture content in the plastic emulsified oil/fat composition of the present invention is preferably 5 to 48 mass%, more preferably 9 to 44 mass%, further preferably 14 to 39 mass% with respect to the mass of the composition. When the
5 moisture content is lower than 5 mass% with respect to the mass of the composition, stable incorporation of the above-mentioned glucomannan (1) and glycerol mono-fatty acid ester (2) may become difficult. Furthermore, since the extensibility of the obtained bakery dough may be deteriorated, and the bakery dough is easily dried, the volume of the obtained bakery product is decreased, and the texture and aging resistance
10 may also be deteriorated. On the other hand, when the moisture content is more than 48 mass%, the obtained bakery dough easily becomes tacky, and the oily component is easily separated. In addition, in the case when sub-raw materials containing moisture are used in the plastic emulsified oil/fat composition for kneading in bakery products of the present invention, the moisture component included in those sub-raw materials is
15 also included in the content of the above-mentioned moisture.

[0065]

It is preferable that the plastic emulsified oil/fat composition of the present invention has a water-in-oil type emulsification form. The water-in-oil type emulsification form refers to that an aqueous phase is dispersed in a continuous oil
20 phase. Specifically, it is preferable that the oil/fat composition contains moisture that is more than the moisture required for the swelling of the glucomannan. Furthermore, the water-in-oil type referred to in the present invention includes an oil-in-water-in-oil type.

[0066]

It is preferable that the plastic emulsified oil/fat composition of the present invention is free from proteinases. In the case when wheat flour having a high ash content is used, the gluten in the obtained bakery dough is characterized by strong elasticity and brittleness as mentioned above. Therefore, a method for decomposing a part of the gluten structure once by using a proteinase so as to obtain a fine gluten structure is generally conducted. However, since a part of a preferable gluten structure that is required for firmness after baking is also decomposed by the proteinase, a problem that the form is collapsed after baking or during toasting easily occurs.

[0067]

In the plastic emulsified oil/fat composition of the present invention, since a fine gluten structure can be formed without using a proteinase, it is preferable to not use a proteinase. The proteinase may include commercially available products such as trade name "SUMIZYME LPL" (Shin Nihon Chemical Co. Ltd.), trade name "Protease A "AMANO"" (Amano Enzyme Inc.), trade name "DENATYME AP" (Nagase Chemtex Corporation), trade name "PANTIDASE P" (Yakult Pharmaceutical Industry Co., Ltd.), trade name "PTN" (Novozymes Japan) and trade name "NEUTRASE" (Novozymes Japan).

[0068]

Where necessary, other raw materials that can be used in general plastic emulsified oil/fat compositions for kneading in bakery products other than those mentioned above can be used in the plastic emulsified oil/fat composition of the present

invention. Examples of the other raw materials may include enzymes other than proteinases such as α -amylase, maltose-generating α -amylase, β -amylase, isoamylase and glucoamylase, thickening polysaccharides other than glucomannan, emulsifiers other than glycerol mono-fatty acid esters, starches, oxidizing agents, amino acids, salt
5 taste agents such as dietary salt and potassium chloride, acidulants such as acetic acid, lactic acid and gluconic acid, milk and milk products such as cow milk, condensed milk, skim powdered milk, milk serum mineral, casein, whey powder, milk fat globule membrane protein, butter, cream, natural cheese, processed cheese and fermented milk, sugars and sugar alcohols, sweeteners such as stevia and aspartame, β -carotene, caramel,
10 colorants such as monascus color, antioxidants such as tocopherol and tea extracts, vegetable proteins such as wheat protein and soybean protein, egg and various processed egg products, flavoring materials, seasonings, pH adjusting agents, food preserving agents, shelflife improving agents, food materials such as fruits, fruit juices, coffee, nut pastes, spices, cacao mass, cocoa powders, grains, beans, vegetables, meats
15 and sea foods, and food additives.

[0069]

Although the above-mentioned other raw materials can be arbitrarily used as long as the effect of the present invention is not lost, they are used in the range of preferably 30 mass% or less, more preferably 10 mass% or less in total in the plastic
20 emulsified oil/fat composition of the present invention.

[0070]

Next, a preferable method for producing the plastic emulsified oil/fat composition of the present invention will be explained.

The plastic emulsified oil/fat composition of the present invention can be obtained by homogeneously mixing an oil phase, and an aqueous phase or oil-in-water type emulsified product containing glucomannan and a glycerol mono-fatty acid ester.

[0071]

5 The above-mentioned oil phase is formed by compounding one or more oil/fats, and, if necessary, oil-soluble components as other components. On the other hand, the above-mentioned aqueous phase is formed by adding the above-mentioned glucomannan (1) and glycerol mono-fatty acid ester (2), and, if necessary, water-soluble components as other components to water. When the above-mentioned components
10 (1) and (2) are dissolved in water, it is preferable to dissolve in two stages, i.e., to dissolve the component (1) first, and subsequently dissolve the component (2). This is because, when the component (1) is added later, it is not preferable since it takes too long time for hydration.

[0072]

15 In the case when the plastic emulsified oil/fat composition of the present invention is an oil-in-water-in-oil type, a part of the oil phase is added to the above-mentioned aqueous phase and mixed in advance according to a conventional method. The oil phase in the oil-in-water type emulsified product (the innermost phase of the oil-in-water-in-oil type emulsified oil/fat composition) may have the same
20 composition as the oil phase used later (the outermost phase of the oil-in-water-in-oil type emulsified oil/fat composition), or may be a different composition.

[0073]

The mixing of the above-mentioned oil phase and the above-mentioned aqueous phase or the above-mentioned oil-in-water type emulsified product is sufficient as long as they can be homogeneously mixed, and may be conducted according to a conventional method.

5 [0074]

Below is described an example of preferable production method of the plastic emulsified oil/fat composition of the present invention in the case when the composition is a water-in-oil type emulsified product.

10 First, an oil phase and an aqueous phase are respectively prepared as mentioned above. Next, the above-mentioned oil phase is dissolved, the above-mentioned aqueous phase is added thereto, and mixing emulsification is conducted to give a pre-emulsified product. Subsequently, the pre-emulsified product is subjected to a sterilization treatment as necessary. The sterilization method may be a batch system in a tank, or a continuous system using a plate-type heat exchanger or a scraper-type heat
15 exchanger.

[0075]

Subsequently, the above-mentioned pre-emulsified product is cooled and crystallized to give the plastic emulsified oil/fat composition of the present invention. During the cooling, cooling-plasticization is conducted. The cooling velocity is
20 preferably $-0.5^{\circ}\text{C}/\text{min}$ or more, further preferably $-5^{\circ}\text{C}/\text{min}$ or more. At this time, rapid cooling is more preferable than slow cooling.

The cooling device may include closed continuous-type tube coolers such as margarine making machines such as a votator, a combinator and a perfector, and

plate-type heat exchangers, and the like, and may also include a combination of an open-type diacooler and a conprector.

Furthermore, it is also possible to incorporate nitrogen, air and the like in any step for the production of the plastic emulsified oil/fat composition of the present invention.

[0076]

In addition, it is preferable to produce the plastic emulsified oil/fat composition for kneading in bakery products containing a proteinase by the following method.

A first aqueous phase or oil-in-water type emulsified product containing a glycerol mono-fatty acid ester, and a second aqueous phase or oil-in-water type emulsified product containing a proteinase are prepared. The oil phase and the first aqueous phase or oil-in-water type emulsified product are mixed and subjected to cooling-plasticization to give a plastic emulsified oil/fat composition. The second aqueous phase or oil-in-water type emulsified product is mixed with the obtained plastic emulsified oil/fat composition. The compositions of the first aqueous phase or oil-in-water type emulsified product and the second aqueous phase or oil-in-water type emulsified product may be the same or different for the components other than the glycerol mono-fatty acid ester and proteinase.

[0077]

The plastic emulsified oil/fat composition of the present invention can be used for various bakery doughs for round top bread loafs, square-type bread loafs, hot dog buns, various breads, bread rolls, sweet buns, sweet rolls, Danish pastry, buns, brioches,

muffins, bagels, scones, English muffins, doughnuts, pizzas, steamed bread, waffles and the like.

[0078]

Next, the bakery dough of the present invention will be mentioned.

5 The bakery dough of the present invention is a bakery dough using the plastic emulsified oil/fat composition for kneading in bakery products of the present invention.

 Although the use amount of the plastic emulsified oil/fat composition for kneading in bakery products of the present invention in the bakery dough of the present invention is similar to that in a conventional plastic oil/fat composition for kneading in
10 bakery products, and differs depending on the kind of the bakery product, the use amount is preferably 2 to 30 parts by mass, more preferably 4 to 20 parts by mass with respect to 100 parts by mass of a grain powder included in the dough.

[0079]

 Examples of the above-mentioned grain powder may include wheat flours (soft
15 flour, all-purpose flour, semi-hard flour, hard flour), wheat germ, whole grain flour, wheat bran, durum wheat flour, barley flour, rice flour, rye flour, rye whole grain flour, soybean powder, Chinese pearl barley powder and the like, and one kind or two or more kinds selected from these can be used. In the present invention, among these, wheat flour is used by preferably 50 mass% or more, more preferably 80 mass% or more,
20 further preferably 100 mass% in the grain powder.

[0080]

In the case when a grain powder other than wheat flour is used, it is preferable to further add gluten. The addition amount of gluten is an amount that makes the protein content preferably 5 to 20 mass%, more preferably 10 to 18 mass% with respect to the total mass of the grain powder and gluten.

5 [0081]

Furthermore, in the case when wheat flour is used, wheat flour having any ash content may be used, and even wheat flour having an ash content of 0.45 mass% or more can also be used. Although it is generally considered that wheat flour having such a high ash content is not suitable for a bakery dough, specifically a bakery dough
10 for a bread loaf, a bakery product having an equivalent quality to that of general wheat flour having an ash content of lower than 0.45 mass% can be obtained by using the plastic emulsified oil/fat composition for kneading in bakery products of the present invention.

[0082]

15 In the bakery dough of the present invention, where necessary, other raw materials that can be used as general materials for bakery product making can be used. Examples of the other raw materials may include water, oils and fats, yeasts, sugars and sweeteners, thickening agents, colorants, antioxidants, dextrins, milk and milk products, cheeses, distilled spirits, brews, various liqueurs, emulsifiers, inflating agents, inorganic
20 salts, dietary salt, baking powders, yeast foods, cacao and cacao products, coffee and coffee products, herbs, beans, proteins, preserving agents, bittering agents, acidulants, pH adjusting agents, shelflife improving agents, fruits, fruit juices, jams, fruit sauces, seasonings, spices, flavor materials, various food materials, food additives and the like.

[0083]

The above-mentioned other raw materials can optionally be used as long as the effect of the present invention is not lost, and it is preferable that water is used in the range of 30 to 100 parts by mass, more preferably 30 to 70 parts by mass in total with respect to 100 parts by mass of the above-mentioned grain powder. Furthermore, it is preferable that the raw materials other than water are used in the range of 100 parts by mass or less, more preferably 50 parts by mass or less in total with respect to 100 parts by mass of the above-mentioned grain powder.

[0084]

Next, the method for producing the bakery dough of the present invention will be explained.

The bakery dough of the present invention can be produced by kneading the plastic emulsified oil/fat composition of the present invention into the dough.

For the bakery dough of the present invention, all bakery product making methods that have been conventionally used as methods for bakery product making such as a sponge and dough method, a straight dough method, a pre-ferment and dough method, a soaker method and a hot water dough method can be adopted. In the case when the bakery dough of the present invention is produced by a sponge and dough method, the bakery dough can be produced by kneading the plastic emulsified oil/fat composition of the present invention into a sponge dough and/or a dough for dough mixing.

Furthermore, the obtained dough of the present invention can be stored in a refrigerator or freezer.

[0085]

A bakery product can be obtained by suitably dividing and molding the above-mentioned dough of the present invention, subjecting the dough to final proof, retard and rest as necessary, and subjecting the dough to a heat treatment.

5 The above-mentioned molding may be formed into any shape, or panning may be conducted. These moldings may be conducted by manual operations, or may be conducted by full-automatic by using a continuous line.

The above-mentioned heat treatment may include baking, steaming, frying and the like. Two or more kinds of these heat treatments may be used in combination.

10 Furthermore, the obtained bakery product can also be stored in a refrigerator or freezer, and can be heated in a microwave oven after the storage.

Examples

[0086]

Hereinafter the present invention will further be explained in detail by
15 Examples, Comparative Examples, Use Examples and the like of the present invention, but the present invention is not limited by the following Examples and the like.

In the following Examples 1 to 15 and Comparative Examples 1 to 5, the plastic emulsified oil/fat compositions for kneading in bakery products of the present invention and comparative plastic emulsified oil/fat compositions for kneading in
20 bakery products were respectively produced, and in the following Use Examples 1 to 16 and Comparative Use Examples 1 to 5, bakery doughs are produced by respectively using these plastic emulsified oil/fat compositions for kneading in bakery products, bakery products were baked from the bakery doughs, and the obtained bakery products

were evaluated. In the production of the bakery doughs, wheat flour having a high ash content was used in Use Examples 1 to 15 and Comparative Use Examples 1 to 5, and wheat flour having a low ash content was used in Use Example 16.

In the following Examples and the like, S represents a saturated fatty acid, and M represents a monounsaturated fatty acid.

[0087]

[Example 1]

<Production of plastic emulsified oil/fat composition 1>

A mixed oil/fat was obtained by homogeneously mixing 80 parts by mass of a random transesterified oil/fat of palm olein (iodine value: 56) and 20 parts by mass of soybean oil. 68.47 parts by mass of the mixed oil/fat was further mixed with 0.01 parts by mass of 60% tocopherol, 1.5 parts by mass of a glycerin monopalmitic acid ester and 0.02 parts by mass of a flavor material. The resulting mixture was dissolved to give an oil phase, and the temperature of the oil phase was kept at 60°C.

On the other hand, 0.1 parts by mass of a glucomannan-containing material (the purity of the glucomannan was 70 mass%, and the impurities in the residual part were starches, oxalic acid, potassium oxalate and the like, the same shall apply hereinafter) was added as the component (1) to 22.9 parts by mass of water and dissolved in the water to give a solution, and the temperature of the solution was adjusted to 60°C. 3.0 parts by mass of a glycerin monopalmitic acid ester as the component (2) was added to the solution and dispersed in the solution. The pH of the resulting dispersion was adjusted to 4 by using citric acid while the dispersion was kept at 60°C to thereby give aqueous phase 1.

[0088]

The above-mentioned aqueous phase was added to the above-mentioned oil phase, and mixing emulsification was conducted to give a pre-emulsified product. The pre-emulsified product was plasticized under rapid cooling by using a combinator. The resulting product was further cooled to 15°C.

Aqueous phase 2 was prepared by mixing 3.92 parts by mass of water and 0.08 parts by mass of a liquid formulation of a proteinase (manufactured by Novozymes Japan, trade name: NEUTRASE, the pure protein content of the proteinase: 30 mass%). The aqueous phase 2 was added to the above-mentioned cooled product, and the mixture was homogeneously mixed in an in-line mixer to give the plastic emulsified oil/fat composition 1 of a water-in-oil type.

In the oil phase of the obtained plastic emulsified oil/fat composition 1, the content of SMS was 7.5 mass% and the content of MSM was 6.5 mass% with respect to the mass of the oil phase.

[0089]

[Example 2]

<Production of plastic emulsified oil/fat composition 2>

A mixed oil/fat was obtained by homogeneously mixing 80 parts by mass of a random transesterified oil/fat of palm olein (iodine value: 56) and 20 parts by mass of soybean oil. 68.47 parts by mass of the mixed oil/fat was further mixed with 0.01 parts by mass of 60% tocopherol, 1.5 parts by mass of a glycerin monopalmitic acid ester and 0.02 parts by mass of a flavor material. The resulting mixture was dissolved to give an oil phase, and the temperature of the oil phase was kept at 60°C.

On the other hand, 0.1 parts by mass of a glucomannan-containing material was added as the component (1) to 26.9 parts by mass of water and dissolved in the water to give a solution, and the temperature of the solution was adjusted to 60°C. 3.0 parts by mass of a glycerin monopalmitic acid ester as the component (2) was added to the solution and dispersed in the solution. The pH of resulting dispersion was adjusted to 4 by using citric acid while the dispersion was kept at 60°C to thereby give an aqueous phase.

[0090]

The above-mentioned aqueous phase was added to the above-mentioned oil phase, and mixing emulsification was conducted to give a pre-emulsified product. The pre-emulsified product was plasticized under rapid cooling by using a combinator to give the plastic emulsified oil/fat composition 2 of a water-in-oil type.

In the oil phase of the obtained plastic emulsified oil/fat composition 2, the content of SMS was 7.5 mass% and the content of MSM was 6.5 mass% with respect to the mass of the oil phase.

[0091]

[Example 3]

<Production of plastic emulsified oil/fat composition 3>

The plastic emulsified oil/fat composition 3 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 26.94 parts by mass, and the amount of the glucomannan-containing material was changed to 0.06 parts by mass.

[0092]

[Example 4]

<Production of plastic emulsified oil/fat composition 4>

5 The plastic emulsified oil/fat composition 4 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 24.60 parts by mass, the amount of glycerin monopalmitic acid ester was changed to 5.0 parts by mass, and the amount of the glucomannan-containing material was changed to 0.40 parts by mass.

[0093]

10 [Example 5]

<Production of plastic emulsified oil/fat composition 5>

15 The plastic emulsified oil/fat composition 5 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 26.98 parts by mass, and the amount of the glucomannan-containing material was changed to 0.02 parts by mass.

[0094]

[Example 6]

<Production of plastic emulsified oil/fat composition 6>

20 The plastic emulsified oil/fat composition 6 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 26.30 parts by mass, and the amount of the glucomannan-containing material was changed to 0.70 parts by mass.

[0095]

[Example 7]

<Production of plastic emulsified oil/fat composition 7>

The plastic emulsified oil/fat composition 7 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 26.00 parts by mass, and the amount of the glucomannan-containing material was changed to 1.00 part by mass.

[0096]

[Example 8]

<Production of plastic emulsified oil/fat composition 8>

The plastic emulsified oil/fat composition 8 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 24.50 parts by mass, and the amount of the glucomannan-containing material was changed to 2.50 parts by mass.

[0097]

[Example 9]

<Production of plastic emulsified oil/fat composition 9>

The plastic emulsified oil/fat composition 9 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 29.30 parts by mass, and the amount of glycerin monopalmitic acid ester was changed to 0.6 parts by mass.

[0098]

[Example 10]

<Production of plastic emulsified oil/fat composition 10>

The plastic emulsified oil/fat composition 10 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 20.90 parts by mass, and the amount of glycerin monopalmitic acid ester was changed to 9.0 parts by mass.

[0099]

[Example 11]

<Production of plastic emulsified oil/fat composition 11>

A mixed oil/fat was obtained by homogeneously mixing 95 parts by mass of a random transesterified oil/fat of palm olein (iodine value: 65) and 5 parts by mass of palm stearin. 68.47 parts by mass of the mixed oil/fat was further mixed with 0.01 parts by mass of 60% tocopherol, 1.5 parts of a glycerin monopalmitic acid ester and 0.02 parts by mass of a flavor material. The resulting mixture was dissolved to give an oil phase, and the temperature of the oil phase was kept at 60°C.

On the other hand, 0.1 parts by mass of a glucomannan-containing material was added as the component (1) to 26.9 parts by mass of water and dissolved in the water to give a solution, and the temperature of the solution was adjusted to 60°C. 3.0 parts by mass of a glycerin monopalmitic acid ester was added to the solution as the component (2) and dispersed in the solution. The pH of resulting dispersion was adjusted to 4 by using citric acid while the dispersion was kept at 60°C to thereby give an aqueous phase.

The above-mentioned aqueous phase was added to the above-mentioned oil phase, and mixing emulsification was conducted to give a pre-emulsified product. The

pre-emulsified product was plasticized under rapid cooling by using a combinator to give the plastic emulsified oil/fat composition 11 of a water-in-oil type.

In the oil phase of the obtained plastic emulsified oil/fat composition 11, the content of SMS was 7.1 mass% and the content of MSM was 7.0 mass% with respect to the mass of the oil phase.

[0100]

[Example 12]

<Production of plastic emulsified oil/fat composition 12>

A mixed oil/fat was obtained by homogeneously mixing 80 parts by mass of palm oil and 20 parts by mass of soybean oil. 68.47 parts by mass of the mixed oil/fat was further mixed with 0.01 parts by mass of 60% tocopherol, 1.5 parts by mass of a glycerin monopalmitic acid ester and 0.02 parts by mass of a flavor material. The resulting mixture was dissolved to give an oil phase, and the temperature of the oil phase was kept at 60°C.

On the other hand, 0.1 parts by mass of a glucomannan-containing material was added as the component (1) to 26.9 parts by mass of water and dissolved in the water, and the temperature of the resulting solution was adjusted to 60°C. 3.0 parts by mass of a glycerin monopalmitic acid ester as the component (2) was added to the solution and dispersed, and the pH of the resulting dispersion was adjusted to 4 by using citric acid while the dispersion was kept at 60°C to thereby give an aqueous phase.

The above-mentioned aqueous phase was added to the above-mentioned oil phase, and mixing emulsification was conducted to give a pre-emulsified product. The pre-emulsified product was plasticized under rapid cooling by using a combinator to give the plastic emulsified oil/fat composition 12 of a water-in-oil type.

In the oil phase of the obtained plastic emulsified oil/fat composition 12, the content of SMS was 19.9 mass% and the content of MSM was 1.3 mass% with respect to the mass of the oil phase.

[0101]

5 [Comparative Example 1]

<Production of plastic emulsified oil/fat composition 13>

The plastic emulsified oil/fat composition 13 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except that the amount of glucomannan-containing material was changed from 0.1 parts by mass to 0.0
10 parts by mass, and that the amount of water was changed to 27 parts by mass.

[0102]

[Comparative Example 2]

<Production of plastic emulsified oil/fat composition 14>

The plastic emulsified oil/fat composition 14 was obtained in a similar method
15 to that of <Production of plastic emulsified oil/fat composition 2>, except that 0.1 parts by mass of xanthane gum was used instead of 0.1 parts by mass of the glucomannan-containing material.

[0103]

[Comparative Example 3]

20 <Production of plastic emulsified oil/fat composition 15>

The plastic emulsified oil/fat composition 15 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except that 0.1 parts

by mass of sodium alginate was used instead of 0.1 parts by mass of the glucomannan-containing material.

[0104]

[Comparative Example 4]

5 <Production of plastic emulsified oil/fat composition 16>

A mixed oil/fat was obtained by homogeneously mixing 80 parts by mass of a random transesterified oil/fat of palm olein (iodine value: 56) and 20 parts by mass of soybean oil. 68.47 parts by mass of the mixed oil/fat was further mixed with 0.01 parts by mass of 60% tocopherol, 1.5 parts by mass of a glycerin monopalmitic acid ester, 3.0 parts by mass of a monoglycerin fatty acid of succinic acid and 0.02 parts by mass of a flavor material. The resulting mixture was dissolved to give an oil phase, and the temperature of the oil phase was kept at 60°C.

On the other hand, 0.1 parts by mass of a glucomannan-containing material was added as the component (1) to 26.9 parts by mass of water and dissolved in the water, and the temperature of the resulting solution was adjusted to 60°C. Furthermore, the pH of the solution was adjusted to 4 by using citric acid to thereby give an aqueous phase.

The above-mentioned aqueous phase was added to the above-mentioned oil phase, and mixing emulsification was conducted to give a pre-emulsified product. The pre-emulsified product was plasticized under rapid cooling by using a combinator to give the plastic emulsified oil/fat composition 16 of a water-in-oil type.

In the oil phase of the obtained plastic emulsified oil/fat composition 16, the content of SMS was 7.5 mass% and the content of MSM was 6.5 mass% with respect to the mass of the oil phase.

[0105]

[Comparative Example 5]

<Production of plastic emulsified oil/fat composition 17>

A mixed oil/fat was obtained by homogeneously mixing 80 parts by mass of a random transesterified oil/fat of palm olein (iodine value: 56) and 20 parts by mass of soybean oil. 68.47 parts by mass of the mixed oil/fat was further mixed with 0.01 parts by mass of 60% tocopherol, 4.5 parts by mass of a glycerin monopalmitic acid ester and 0.02 parts by mass of a flavor material. The resulting mixture was dissolved to give an oil phase, and the temperature of the oil phase was kept at 60°C.

On the other hand, 0.1 parts by mass of a glucomannan-containing material was added as the component (1) to 26.9 parts by mass of water and dissolved in the water to give a solution. The temperature of the solution was adjusted to 60°C. The pH of the solution was adjusted to 4 by using citric acid to thereby give an aqueous phase.

The above-mentioned aqueous phase was added to the above-mentioned oil phase, and mixing emulsification was conducted to give a pre-emulsified product. The pre-emulsified product was plasticized under rapid cooling by using a combinator to give the plastic emulsified oil/fat composition 17 of a water-in-oil type.

In the oil phase of the obtained plastic emulsified oil/fat composition 17, the content of SMS was 7.5 mass% and the content of MSM was 6.5 mass% with respect to the mass of the oil phase.

[0106]

[Example 13]

<Production of plastic emulsified oil/fat composition 18>

The plastic emulsified oil/fat composition 18 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 24.45 parts by mass, the amount of glycerin monopalmitic acid ester was changed to 5.0 parts by mass, and the amount of the glucomannan-containing material was changed to 0.55 parts by mass.

[0107]

[Example 14]

<Production of plastic emulsified oil/fat composition 19>

The plastic emulsified oil/fat composition 19 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 23.5 parts by mass, the amount of glycerin monopalmitic acid ester was changed to 5.0 parts by mass, and the amount of the glucomannan-containing material was changed to 1.5 parts by mass.

[0108]

[Example 15]

<Production of plastic emulsified oil/fat composition 20>

The plastic emulsified oil/fat composition 20 was obtained in a similar method to that of <Production of plastic emulsified oil/fat composition 2>, except the amount of water was changed to 17.4 parts by mass, the amount of glycerin monopalmitic acid ester was changed to 12.5 parts by mass.

[0109]

Whether the obtained plastic emulsified oil/fat composition 1 contained the glycerin monopalmitic acid ester in the aqueous phase in the above-mentioned Example 1 was ascertained by the following method.

First, the plastic emulsified oil/fat composition 1 was completely dissolved at 60 to 65°C, the oil phase was removed from the dissolved emulsified oil/fat composition 1, and only the aqueous phase part was completely dried at 100 to 110°C. Subsequently, the lipid component included in the dried aqueous phase part was analyzed by gas chromatography to ascertain the presence of the glycerin monopalmitic acid ester in the aqueous phase. Similar ascertaining was done also in Examples 2 to 15.

[0110]

[Use Examples 1 to 15, and Comparative Use Examples 1 to 5]

<Composition and method for production of pullman loaf>

70 parts by mass of hard flour (imported wheat flour, protein content: 13.0 mass%, ash: 0.52 mass%), 2 parts by mass of raw yeast, 0.1 parts by mass of yeast food and 40 parts by mass of water were put into a mixer bowl, and mixed at a low velocity for 2 minutes and at a middle velocity for 2 minutes by using a hook to give a sponge dough. The dough temperature was 24°C. This sponge dough was put into a dough box, and sponge fermentation was conducted for 4 hours in a temperature-controlled room at a temperature of 28°C and a relative humidity of 85%. The end point temperature was 29°C.

After the sponge fermentation was completed, the fermented dough was put into a mixer bowl again, and 30 parts by mass of hard flour (imported wheat flour, protein content: 13.0 mass%, ash content: 0.52 mass%), 5 parts by mass of superfine

sugar, 2 parts by mass of skim powdered milk, 1.5 parts by mass of dietary salt and 25 parts by mass of water were further added thereto, and mixed at a low velocity for 3 minutes and at a middle velocity for 3 minutes. At this point, 8 parts by mass of the plastic emulsified oil/fat composition was added thereto, and further mixing was conducted at a low velocity for 3 minutes, at a middle velocity for 3 minutes and at a high velocity for 1 minute by using a hook to give a dough for a bread loaf. The dough temperature of the obtained dough for a bread loaf was 28°C.

At this time, a floor time was taken for 20 minutes, and the dough was divided into 230 g and rounded. Subsequently, a bench time was taken for 20 minutes, molding was conducted in a molder, six pieces were each formed into a horseshoe shape and put into a three-loaf type pullman bread mold, final proof was conducted at 38°C under a relative humidity of 85% for 50 minutes, and the dough was put into a peel oven preset to 200°C and baked for 40 minutes to give a pullman loaf.

The plastic emulsified oil/fat compositions for kneading in bakery products used in the respective Use Examples and Comparative Use Examples are shown in Table 2 -1 and 2-2.

[0111]

[Use Example 16]

A pullman loaf was obtained in a similar manner to Use Example 1, except that hard flour (trade name: CAMELLIA, manufactured by Nisshin Flour Milling Inc., protein content: 11.8 mass%, ash content: 0.37 mass%) was used instead of the hard flour (imported wheat flour).

[0112]

For the pullman loafs obtained in the above-mentioned respective Use Examples and Comparative Use Examples, the dough workability, appearance (coloring, volume, firmness), inner phase (texture, hue), flavor, texture (moist feeling, softness, crispy touch), texture after two days and shape when toasted after two days were evaluated according to the following evaluation criteria. The evaluation results are shown in Tables 2-1 and 2-2. In addition, Tables 1-1 and 1-2 summarize the contents of SMS and MSM, the content of the glycerol mono-fatty acid ester and the content of the glucomannan in the plastic emulsified oil/fat compositions 1 to 20 used.

[0113]

<Evaluation criteria>

• Dough workability

⊙: The dough was not tacky and had fine extensibility, and thus had extremely fine workability.

○: The dough had fine workability.

Δ: The dough was felt slightly tacky or had slightly bad extensibility, and thus had slightly poor workability.

×: The dough was tacky or had bad extensibility, and thus had poor workability.

• Appearance (coloring)

⊙: Extremely fine

○: Fine

Δ: The color of baking was slightly dingy.

×: The color was reddish-brown.

• Appearance (volume)

⊙: The pullman loaf had a large volume, and had thin and even white lines. The angles of the four corners on the top surface of the loaf were sharpened.

○: The pullman loaf had a large volume and white lines. The angles of the four corners on the top surface were sharpened.

Δ: The pullman loaf had a slightly small volume and had no clear white lines. The angles of the four corners on the top surface were rounded.

×: The pullman loaf had a small volume, and thus the upper surface was not a plane but a curved surface.

• Appearance (firmness)

⊙: Cave-in was not observed at all.

○: Slight thinning by baking was observed, but cave-in was not observed.

Δ: Slight cave-in was observed.

×: Strong cave-in was observed.

[0114]

• Inner phase (texture)

⊙: The air bubble membranes were thin, homogeneous and in the form of vertical streaks.

○: The air bubble membranes were thin and homogeneous.

Δ: The air bubble membranes were inhomogeneous, and the texture was slightly dense.

×: The air bubble membranes were thick and inhomogeneous, and the texture was thick.

• Inner phase (hue)

⊙: The hue was shiny white and extremely fine.

○: The hue was almost white and fine.

Δ: The color was slightly dingy.

×: The color was dark and dingy.

5 • Flavor

⊙: Extremely fine.

○: Fine.

Δ: The flavor had astringent taste and steamy smell.

×: The flavor astringent taste and strong steamy smell.

10 [0115]

• Texture (moist feeling)

⊙: Extremely fine.

○: Fine.

Δ: Slightly bad.

15 ×: Bad.

• Texture (softness)

⊙: Extremely fine.

○: Fine.

Δ: Slightly bad.

20 ×: Bad.

• Texture (crispy touch)

⊙: Extremely fine.

○: Fine.

△: Slightly sticky.

×: Strongly sticky.

[0116]

5 • Texture after two days

⊙: The texture was soft, and also had fine crispy touch.

○: The texture was soft.

△: The texture was hard, and thus was slightly bad.

×: The texture was hard and strongly elastic, and thus was extremely bad.

10 • Shape when toasted after two days

⊙: The shape was not changed, and thus was extremely fine.

○: Slight distortion was observed in the shape.

△: Distortion was observed in the shape.

×: The shape was significantly curved, and thus was extremely bad.

[0117]

[Table 1-1]

		Examples (plastic emulsified oil/fat compositions)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Plastic emulsified oil/fat composition No.		1	2	3	4	5	6	7	8	9	10	11	12	18	19	20
Oil phase	Content of SMS (mass%)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.1	19.9	7.5	7.5	7.5
	Content of MSM (mass%)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7	1.3	6.5	6.5	6.5
Content of glycerol mono-fatty acid ester in aqueous phase (with respect to mass of plastic emulsified oil/fat composition, mass%)		3	3	3	5	3	3	3	3	0.6	9	3	3	5	5	12.5
Content of glycerol mono-fatty acid ester in plastic emulsified oil/fat composition (With respect to mass of plastic emulsified oil/fat composition, mass%)		4.5	4.5	4.5	6.5	4.5	4.5	4.5	4.5	2.1	10.5	4.5	4.5	6.5	6.5	14
Content of glucomannan in aqueous phase (With respect to mass of plastic emulsified oil/fat composition, mass%)		0.07	0.07	0.042	0.28	0.014	0.49	0.7	1.75	0.07	0.07	0.07	0.07	0.39	1.05	0.07
Content of glucomannan in aqueous phase (With respect to mass of aqueous phase, mass%)		0.23	0.23	0.14	0.93	0.05	1.63	2.33	5.83	0.23	0.23	0.23	0.23	1.28	3.50	0.23

[0118]

[Table 1-2]

		Comparative Examples (plastic emulsified oil/fat compositions)				
		1	2	3	4	5
Plastic emulsified oil/fat composition No.		13	14	15	16	17
Oil phase	Content of SMS (mass%)	7.5	7.5	7.5	7.5	7.5
	Content of MSM (mass%)	6.5	6.5	6.5	6.5	6.5
Content of glycerol mono-fatty acid ester in aqueous phase (With respect to mass of plastic emulsified oil/fat composition, mass%)		3	3	3	0	0
Content of glycerol mono-fatty acid ester in plastic emulsified oil/fat composition (With respect to mass of plastic emulsified oil/fat composition, mass%)		4.5	4.5	4.5	1.5	4.5
Content of glucomannan in aqueous phase (With respect to mass of plastic emulsified oil/fat composition, mass%)		0	0	0	0.07	0.07
Content of glucomannan in aqueous phase (With respect to mass of aqueous phase, mass%)		0.00	0.00	0.00	0.26	0.26

[0119]

[Table 2-1]

	Use Examples															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Plastic emulsified oil/fat composition used	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dough workability	○	◎	◎	◎	○	◎	◎	○	○	◎	◎	○	◎	◎	◎	◎
Appearance (coloring)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Appearance (volume)	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	○	◎	◎
Appearance (firmness)	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Inner phase (texture)	○	◎	◎	◎	○	◎	◎	○	○	◎	◎	○	◎	◎	◎	◎
Inner phase (hue)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Flavor	○	◎	◎	◎	○	○	○	○	○	○	○	○	◎	○	○	◎
Texture (moist feeling)	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Texture (softness)	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Texture (crispy touch)	◎	◎	◎	◎	○	○	○	○	◎	○	◎	○	◎	○	○	◎
Texture after two days	◎	◎	◎	◎	○	◎	◎	◎	○	◎	◎	◎	◎	◎	○	◎
Shape when toasted	○	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

[0120]

[Table 2-2]

	Comparative Use Examples				
	1	2	3	4	5
Plastic emulsified oil/fat composition used	13	14	15	16	17
Dough workability	△	△	△	○	○
Appearance (coloring)	○	○	○	⊙	⊙
Appearance (volume)	△	△	△	△	△
Appearance (firmness)	△	△	△	⊙	⊙
Inner phase (texture)	△	△	△	△	△
Inner phase (hue)	△	△	△	○	○
Flavor	△	△	△	△	△
Texture (moist feeling)	△	○	○	○	○
Texture (softness)	×	△	×	○	○
Texture (crispy touch)	△	△	△	△	△
Texture after two days	△	△	△	○	○
Shape when toasted	△	△	△	○	○

[0121]

It is understood from the results in Table 2-1 that the obtained bakery dough is not tacky and has fine extensibility when the plastic emulsified oil/fat composition of the present invention is used, even wheat flour having a high ash content is used, and that the bakery product obtained by using the bakery dough has a homogeneous inner phase with vertical streaks, a fine hue and fine flavor without steamy smell, and has soft and fine moist feeling and crispy touch, and is excellent in aging resistance.

On the other hand, it is understood from the results in Table 2-2, any of the bakery product making workability and the qualities of the bakery product are not satisfied when a plastic emulsified oil/fat composition that lacks either (1) a glucomannan and (2) or a glycerol mono-fatty acid ester in an aqueous phase is used.

CLAIMS

1. A plastic emulsified oil/fat composition for kneading in bakery products, containing glucomannan and a glycerol mono-fatty acid ester in an aqueous phase.
2. The plastic emulsified oil/fat composition for kneading in bakery products according to claim 1, wherein the content of the glucomannan is 0.01 to 2.1 mass%.
3. The plastic emulsified oil/fat composition for kneading in bakery products according to claim 1 or 2, which contains, as the glucomannan, a glucomannan-containing material in which the purity of the glucomannan is 50 mass% or more.
4. The plastic emulsified oil/fat composition for kneading in bakery products according to any one of claims 1 to 3, wherein the content of the glycerol mono-fatty acid ester in the aqueous phase is 0.5 to 14 mass% with respect to the mass of the plastic emulsified oil/fat composition.
5. The plastic emulsified oil/fat composition for kneading in bakery products according to any one of claims 1 to 4, which contains a direct β -form oil/fat crystal in an oil phase.
6. The plastic emulsified oil/fat composition for kneading in bakery products according to claim 5, which contains the direct β -form oil/fat crystal in the oil phase by 5 to 50 mass% with respect to the mass of the oil phase.

7. The plastic emulsified oil/fat composition for kneading in bakery products according to any one of claims 1 to 6, which is free from proteinases.
8. A bakery dough using the plastic emulsified oil/fat composition for kneading in bakery products according to any one of claims 1 to 7.
9. The bakery dough according to claim 8, wherein wheat flour having an ash content of 0.45 mass% or more is used.
10. A method for producing the plastic emulsified oil/fat composition for kneading in bakery products according to any one of claims 1 to 7, comprising mixing an oil phase, and an aqueous phase or oil-in-water type emulsified product containing glucomannan and a glycerol mono-fatty acid ester.