

DESCRIPTION

COMPOSITION FOR BAKERY FOOD PRODUCT

Technical Field

[0001]

The present invention relates to a composition used in production of dough, for example, for a bakery food product.

Background Art

[0002]

Conventionally, bakery food products such as bread and pizza have been preferred to have a crispy dry texture. On the other hand, in foods produced from a dough such as bakery food products and noodles, softness and a moist texture are also favorable properties. For example, there is preference for a bakery food product having a moist texture as if it sticks to lips when being eaten, but having a crispy texture without clinging in a mouth when being chewed. Furthermore, in a case of noodles, those having elasticity and a crispy texture while being soft and chewy are preferred. Such inconsistent textures of the dough can be achieved, for example, in a case of the bakery food product, by baking the dough so as to contain a large number of fine bubbles while increasing a moisture content

of the dough to produce a dough with a brittle structure. However, such a production method requires a complicated or mature technique, and it has been difficult to simply perform the production method.

[0003]

In general, cereal flour and starch, which are main raw materials of the dough for the bakery food product and noodles, are gelatinized and have a chewy texture or moist texture when heated together with water. An attempt to improve the texture of the bakery food product by using this has been proposed. Patent Literature 1 describes a method for producing bread including mixing a part of raw material flour with 1 to 2.5 times of hot water to gelatinize, adding remaining raw materials thereto, and mixing the product. Patent Literature 2 describes that bread having a soft, moist, and chewy texture is produced by mixing a pre-dough, which is obtained by subjecting a mixture of raw material flour and water to pressure-and-heat treatment, with the remaining raw materials. Patent Literature 3 describes a method for producing a sourdough for bread, the method including adding yeast and water to raw material flour containing a gelatinized cereal flour, kneading the mixture, and fermenting the obtained dough.

[0004]

Gluten, which is a protein contained in the wheat

flour, has a property of forming a network structure and imparts moldability and the elasticity to the dough. On the other hand, the gluten hardens the texture of the dough, and thus is not preferable in the chewy texture or the moist texture as described above. Patent Literature 4 describes that a food quality improver produced by dispersing wheat protein in a solvent having a pH of 2.5 to 8.0 and by heating the mixture at a temperature of 50 to 100°C for 2 hours to 30 days to partially modify the wheat protein and gives excellent extensibility to the food.

Citation List

Patent Literature

[0005]

Patent Literature 1: JP S59-156236 A

Patent Literature 2: JP 2003-111555 A

Patent Literature 3: JP 2019-024336 A

Patent Literature 4: JP 2005-168499 A

Summary of Invention

Technical Problem

[0006]

It is desired to produce a dough having a moist texture or chewy texture, a crispy texture, and an excellent melt-in-the-mouth texture by a simple procedure without

requiring a complicated or mature technique.

Solution to Problem

[0007]

The present inventors found that a dough having a moist texture or a chewy texture, a crispy texture, and excellent melt-in-the-mouth texture can be produced by blending a composition, which is produced by mixing previously heat-treated wheat flour with water and then by subjecting the mixture to pressure-and-heat treatment, into the dough.

[0008]

Accordingly, the present invention provides the following.

[1] A composition for a dough food product obtained by subjecting a mixture containing a heat-treated wheat flour and water to pressure-and-heat treatment.

[2] The composition according to [1], in which the heat-treated wheat flour is heat-moisture-treated wheat flour or dry-heated wheat flour.

[3] The composition according to [1] or [2], in which gluten vitality of the composition is from 0 to 30%.

[4] The composition according to any one of [1] to [3], in which a gelatinization degree of the composition is from 40 to 100%.

[5] A method for producing a composition for a dough

food product, including subjecting a mixture containing heat-treated wheat flour and water to pressure-and-heat treatment.

[6] The method according to [5], in which the heat-treated wheat flour is heat-moisture-treated wheat flour or dry-heated wheat flour.

[7] The method according to [5] or [6], in which the mixture is a mixture of 100 parts by mass of raw materials containing the heat-treated wheat flour and 50 to 200 parts by mass of the water.

[8] The method according to any one of [5] to [7], in which the pressure-and-heat treatment is heat treatment at 50 to 200°C for 5 to 120 minutes in a sealed state.

[9] The method according to any one of [5] to [8], in which the gluten vitality of the composition for the dough food product is from 0 to 30%.

[10] The method according to any one of [5] to [9], in which a gelatinization degree of the composition for the dough food product is from 40 to 100%.

[11] A method for producing a dough food product, including:

preparing a dough containing:

the composition for the dough food product according to any one of [1] to [4]; or

the composition for the dough food product produced by

the method according to any one of [5] to [10].

[12] The method according to [11], in which a solid content of the composition for the dough food product in a total solid content of the dough is from 2 to 50 mass%.

[13] The method according to [11] or [12], in which the dough further contains wheat flour.

[14] The method according to any one of [11] to [13], further including heating the prepared dough.

[15] A dough food product containing:

the composition for the dough food product according to any one of [1] to [4]; or

the composition for the dough food product produced by the method according to any one of [5] to [10].

Advantageous Effects of Invention

[0009]

According to the present invention, it is possible to produce the dough food product made of the dough that produces the moist texture or the chewy texture, the crispy texture, and the excellent melt-in-the-mouth texture by a simple procedure. For example, according to the present invention, it is possible to produce the bakery food product having the moist texture, the crispy texture and the excellent melt-in-the-mouth texture.

Description of Embodiments

[0010]

In the present description, the "dough food product" refers to food produced from a dough mainly containing cereal flour, and examples thereof include a bakery food product and noodles. The "bakery food product" is generally produced by fermenting the dough containing cereal flour and auxiliary materials, and then by cooking (for example, baking, steaming, and frying) the dough as necessary. Examples of the bakery food product include bread such as white bread (for example, square-shaped bread and tin bread), roll bread, pastry (for example, red bean paste bread and cream bread), daily dish bread (for example, curry bread), French bread, German bread, croissant, Danish bread, Italian bread, waffle, naan, and pita bread; pizza; Chinese steamed buns and steamed bread; baked confectionery such as cookies, crackers, and biscuits; and fried confectionery such as donuts. In addition, the "noodles" are generally produced by molding a dough obtained by kneading raw material flour mainly containing the cereal flour and liquid, and cooked by boiling, steaming, and the like, and eaten. Examples of the noodles include wheat noodles (udon), cold wheat noodles (hiyamugi), buckwheat noodles, Chinese noodles, pasta, and noodle skins.

[0011]

The composition for the dough food product of the present invention is a composition used for producing the dough for the dough food product such as the bakery food product or the noodles. By blending the composition for the dough food product into the dough, it is possible to impart to the dough the moist texture or the chewy texture, the crispy texture, and the excellent melt-in-the-mouth texture. Preferably, the composition for the dough food product of the present invention is used for producing the dough for the bakery food product.

[0012]

The composition for the dough food product of the present invention (hereinafter, also referred to as the composition of the present invention) can be produced by subjecting a mixture containing a heat-treated wheat flour and water to a pressure-and-heat treatment. In other words, the composition of the present invention is produced through a first heat treatment of heating a wheat flour to obtain a heat-treated wheat flour and a second heat treatment of pressurizing and heating a mixture containing the heat-treated wheat flour and water. It is presumed that these procedures bring about effects of the present invention by imparting properties such as gelatinization of starch, denaturation of protein, and denaturation of gluten

network structure to the composition of the present invention.

[0013]

The wheat flour, as raw materials of the heat-treated wheat flour to be used in production of the composition of the present invention, may be a wheat flour used in food production, and examples thereof include hard wheat flour, semi-hard wheat flour, moderate wheat flour, soft wheat flour, whole-wheat flour, durum flour, and a mixture of two or more thereof. Types of the wheat flour used in the composition of the present invention may vary depending on types of the dough to be produced by using the composition. For example, in a case of producing bread dough, it is preferable to use the moderate wheat flour, the soft wheat flour, or a mixed flour thereof.

[0014]

As a method of the heat treatment of the wheat flour for obtaining the heat-treated wheat flour (the first heat treatment), both heat-moisture-treatment and dry-heat treatment can be adopted. Preferably, the wheat flour is heated under a condition that the wheat flour does not form the dough, that is, the gluten in the wheat flour does not form the network structure. Usually, when 40 parts by mass or more of the water is added to 100 parts by mass of the wheat flour and mixed, glutenin and gliadin constituting

the gluten interact with each other to form the network structure. Therefore, the heat-treated wheat flour used in the present invention is preferably prepared by the heat-moisture treatment using less than 40 parts by mass of water per 100 parts by mass of raw material wheat flour, or the dry-heat treatment.

[0015]

Examples of a method of the heat-moisture treatment include a method in which the water is added to the wheat flour in such an amount that the wheat flour does not form the dough, preferably less than 40 parts by mass of the water per 100 parts by mass of the wheat flour, and the mixture is heated; and a method of heating the wheat flour while spraying water vapor on the wheat flour. More specific examples of the heat-moisture treatment include a method in which the water is sprayed to be added to the wheat flour while the wheat flour is stirred by a high-speed stirrer, and the stirrer is heated so that the wheat flour is heated by the heat transferred from a machine wall; a method of blowing high-temperature water vapor into the stirrer while stirring the wheat flour with the stirrer and performing the heat treatment; a method of heating and stirring the wheat flour and the water by using an extruder; and a method of performing the heat treatment under a saturated water vapor atmosphere by using an

apparatus described in JP unexamined patent publication No. 2009-34038 A. From a viewpoint of improving the texture of the dough, conditions for the heat-moisture treatment are such that a temperature is preferably from 50°C to 300°C, more preferably from 60 to 240°C, further preferably from 100°C to 220°C; and time is preferably from 10 seconds to 2 hours, more preferably from 1 minute to 60 minutes, further preferably from 10 minutes to 30 minutes. The wheat flour subjected to the heat-moisture treatment can be dried by a method such as shelf drying, hot air drying, and fluidized bed drying to be formed into a powder. When the wheat flour is granulated by the heat-moisture treatment, dried wheat flour can be appropriately pulverized as necessary. For the pulverization, known pulverization means such as roll pulverization and pin mill pulverization can be employed as necessary.

[0016]

Examples of the dry-heat treatment method include a method of heating wheat flour with hot air, infrared rays, radiant heat, and the like in an open system or a sealed system. More specific examples of the dry-heat treatment include a method in which the wheat flour is stirred by the stirrer while the stirrer is heated so that the wheat flour is heated by the heat transferred from the machine wall; a method of heating the wheat flour by blowing the hot air

into a rolling tank while stirring the wheat flour in the rolling tank; and a method of heating and stirring the wheat flour using the extruder. From the viewpoint of improving the texture of the dough, conditions for the dry-heat treatment are such that the temperature is preferably from 50°C to 300°C, more preferably from 60 to 240°C, further preferably from 100°C to 220°C; and the time is preferably from 10 seconds to 2 hours, more preferably from 1 minute to 60 minutes, further preferably from 10 minutes to 30 minutes.

[0017]

Next, the obtained mixture containing the heat-treated wheat flour and the water is subjected to the pressure-and-heat treatment (the second heat treatment). The mixture subjected to the pressure-and-heat treatment can contain, in addition to the heat-treated wheat flour, other raw materials that can be blended in the dough food product as necessary. As the other raw materials, any one or two or more selected from the following can be used: saccharides such as sugar, glucose, fructose, converted sugar, starch syrup, maltose, and lactose; egg or egg powder; proteins such as gluten and egg white powder; cereal flour other than the heat-treated wheat flour; processed or unprocessed starch; a dairy product such as skimmed milk powder, whole fat milk powder, cheese powder, and whey powder; fats and

oils such as shortening, butter, margarine, and other animal and vegetable oils; additives such as emulsifiers, leavening agents, thickeners, sweeteners, flavors, colorants, and ascorbic acid; inorganic salts such as common salt; enzymes such as glucosidase, glucose oxidase, amylase, lipase, and hemicellulase; dietary fibers; and the like. The other raw materials can be used in an amount of 150 parts by mass or less, preferably 100 parts by mass or less in total, per 100 parts by mass of the heat-treated wheat flour.

[0018]

The raw materials containing the heat-treated wheat flour and, as necessary, the other raw materials are mixed with water to prepare a mixture. The water to be used is not limited as long as it is edible water such as fresh water or purified water. An amount of the water to be used for preparing the mixture is preferably from 50 to 200 parts by mass, and more preferably from 60 to 160 parts by mass, per 100 parts by mass of the raw materials containing the heat-treated wheat flour (a total amount of the heat-treated wheat flour and the other raw materials). The water temperature may be a normal temperature (for example, 10°C to 40°C). The raw materials and the water may be mixed to the mixture so that the raw material and the water are substantially uniformly dispersed at around the normal

temperature of 10°C to 40°C, and it is not necessary to excessively mix and stir or knead the raw materials and the water. A substantially uniform mixture is prepared by the mixing. Preferably, the mixture is in a paste form.

[0019]

Examples of a method for subjecting the obtained mixture to the pressure-and-heat treatment include a method in which the mixture is heated in a sealed state, for example, in a pressure-resistant sealed container. From the viewpoint of improving the texture of the dough, temperature conditions of the pressure-and-heat treatment is preferably from 50°C to 200°C, more preferably from 105°C to 150°C, and further preferably from 120°C to 140°C, and time conditions are preferably from 5 minutes to 120 minutes, more preferably from 10 minutes to 90 minutes, and further preferably from 10 minutes to 30 minutes. The mixture after the pressure-and-heat treatment can be cooled as necessary, and then can be used as the composition for the dough food product of the present invention. The composition of the present invention is in a paste form after the pressure-and-heat treatment. Alternatively, the composition may be further dehydrated or dried to prepare a solid, granular, or powder composition. When the composition is dried, it is preferable that heat of 50°C or higher is not applied.

[0020]

The composition of the present invention preferably has gluten vitality (hereinafter, also referred to as GV) of 0 to 40%, more preferably 0 to 30%, and further preferably 0 to 20%. When GV of the composition of the present invention is in these ranges, it is preferable from the viewpoint of improving the texture of the dough. GV is an index representing a property of the protein contained in the raw materials such as wheat flour, and is different from a content of the protein in the raw materials. Common GV of the wheat flour is 50 to 60%. GV of the composition of the present invention can be measured in a procedure below by using powder that has been pulverized (hereinafter, the pulverized powder) after freeze-drying the composition to dryness.

[0021]

[Method for measuring GV]

1) Measurement of soluble crude protein content of the pulverized powder:

(a) The pulverized powder (2 g) is precisely weighed and put into a 100 mL beaker.

(b) To the beaker, 40 mL of 0.05N acetic acid is added, and is stirred at a room temperature for 60 minutes to prepare a suspension.

(c) The suspension obtained in (b) above is transferred

to a centrifuge tube, centrifuged at 5000 rpm for 5 minutes, and then filtered by using filter paper to recover a filtrate.

(d) The beaker used above is washed with 40 mL of the 0.05N acetic acid, the washing liquid is transferred to the centrifuge tube, centrifuged at 5000 rpm for 5 minutes, and then filtered by using the filter paper to recover the filtrate.

(e) The filtrates collected in (c) and (d) above are combined and filled up to 100 mL.

(f) Liquid (25 mL) obtained in (e) above is pipetted into a Kjeldahl tube of Kjeltac Auto System produced by Tecator (Sweden) by using a hole pipette, and one tablet of digestion accelerator ("KJELTABS-C" produced by Nippon General Co., Ltd.; potassium sulfate : copper sulfate = 9 : 1 (weight ratio)) and 15 mL of concentrated sulfuric acid are added thereto.

(g) A digestion treatment is performed for 1 hour with a dial 4 by using a Kjeltac digestion furnace (DIGESTION SYSTEM 20 1015 type) incorporated in the Kjeltac Auto System described above, and further, the digestion treatment is automatically performed for 1 hour by using a dial 9 or 10. Following the digestion treatment, liquid subjected to the digestion treatment is distilled and titrated continuously and automatically (0.1N sulfuric acid

is used for titration) by using a Kjelttec distillation titration system (KJELTEC AUTO 1030 type) incorporated in the same Kjelttec Auto System, and the soluble crude protein content of the pulverized powder is determined by Formula 1 below.

(Formula 1) Soluble crude protein content (%)

$$= 0.14 \times T \times F \times N \times (100/S) \times (1/25)$$

where

T = an amount (mL) of the 0.1N sulfuric acid required for the titration

F = titer of the 0.1N sulfuric acid used for the titration (measured at a time of use or a commercially available product with a titer indication is used)

N = nitrogen protein conversion factor (5.70), and

S = an amount (g) of the pulverized powder weighed

2) Measurement of total crude protein content of the pulverized powder:

(a) The pulverized powder (0.5 g) precisely weighed is put into the Kjeldahl tube of the same Kjelttec Auto System produced by Tecator as used in 1) above, and one tablet of the same digestion accelerator as used in (f) of 1) above and 5 mL of the concentrated sulfuric acid are added thereto.

(b) After 1 hour of the digestion treatment with the dial 9 or 10 by using the same Kjelttec Digestion Furnace

incorporated in the same Kjelttec Auto System as used in 1) above, the liquid subjected to the digestion treatment described above is distilled and titrated continuously and automatically (the 0.1N sulfuric acid is used for the titration) by using the same Kjelttec distillation and titration system as used in 1) above incorporated in the same Kjelttec Auto System, and the total crude protein content of the pulverized powder is determined by Formula 2 below.

$$\text{(Formula 2) Total crude protein content (\%)} = (0.14 \times T \times F \times N) / S$$

where

T = an amount (mL) of the 0.1N sulfuric acid required for the titration

F = titer of the 0.1N sulfuric acid used for the titration (measured at a time of use)

N = nitrogen protein conversion factor (5.70), and

S = an amount (g) of the pulverized powder weighed

3) Calculation of GV:

From the soluble crude protein content of the pulverized powder obtained in 1) above and the total crude protein content of the pulverized powder obtained in 2) above, GV of the pulverized powder is determined by Formula 3 below.

$$\text{(Formula 3) GV (\%)} = (\text{soluble crude protein}$$

content/total crude protein content) × 100

[0022]

The composition of the present invention preferably has a gelatinization degree of 40 to 100%, more preferably 50 to 100%. When the gelatinization degree of the composition of the present invention is within these ranges, it is preferable from the viewpoint of improving the texture of the dough. The gelatinization degree of the composition of the present invention refers to the gelatinization degree measured by a BAP method (β -amylase and pullulanase method). As a procedure of the BAP method, a known method described in "Starch Chemistry Vol. 28, No. 4, p. 235 to 240 (1981)" and the like can be adopted. For example, the gelatinization degree of the composition of the present invention can be measured in a procedure below by using the pulverized powder of the composition.

[0023]

[Method for measuring the gelatinization degree by the BAP method]

1) Reagents

Reagents used are as follows:

- (a) 0.8M acetic acid-Na acetate buffer;
- (b) 10N sodium hydroxide solution;
- (c) 2N acetic acid solution;
- (d) Enzyme solution: 0.017 g of β -amylase (Nagase

Biochemical Ltd. #1500) and 0.17 g of pullulanase (Hayashibara Biochemical Laboratories, No. 31001) were dissolved in the 0.8M acetic acid-Na acetate buffer to make 100 mL of solution;

(e) Deactivated enzyme solution: prepared by boiling the enzyme solution for 10 minutes; and

(f) Somogyi reagent and Nelson reagent (reagents for measuring an amount of reducing sugar).

2) Measurement method

(a) The composition of the present invention is pulverized with a homogenizer to have a mesh size of 100 or less. The obtained pulverized powder (0.08 to 0.10 g) is taken in a glass homogenizer.

(b) Demineralized water (8.0 mL) is added thereto, and the glass homogenizer is moved up and down 10 to 20 times to perform dispersion.

(c) The dispersion (2 mL) of (b) above is taken in each of two 25 mL-graduated test tubes, and one tube is fixed in volume with the 0.8M acetic acid-Na acetate buffer and used as a test section.

(d) The 10N sodium hydroxide solution (0.2 mL) is added to the other one and reacted at 50°C for 3 to 5 minutes for complete gelatinization. Thereafter, 1.0 mL of the 2N acetic acid solution is added to adjust pH to around 6.0, and then a volume is adjusted with the 0.8M acetic acid-Na

acetate buffer to obtain a gelatinized section.

(e) Each of test solutions (0.4 mL) belonging to the test section and the gelatinized section prepared in (c) and (d) above is taken, 0.1 mL of the enzyme solution is added thereto, and a mixture is subjected to the enzymatic reaction at 40°C for 30 minutes. Simultaneously, a blank obtained by adding 0.1 mL of a deactivated enzyme solution instead of the enzyme solution is also prepared. The enzymatic reaction is performed while a reaction solution is sometimes stirred halfway.

(f) The Somogyi reagent (0.5 mL) is added to 0.5 mL of the reacted solution, a mixture is boiled in a boiling bath for 15 minutes. After boiling, the mixture is cooled in flowing water for 5 minutes, then 1.0 mL of the Nelson reagent is added, stirred, and left for 15 minutes.

(g) Thereafter, 8.00 mL of the demineralized water is added and stirred, and an absorbance at 500 nm is measured.

3) Calculation of gelatinization degree

The gelatinization degree is calculated by the following formula:

Gelatinization degree (%) = (digestion rate of test solution) / (digestion rate of complete gelatinization test solution) × 100

$$= (A - a) / (A' - a') \times 100$$

where

A = absorbance of test section,

A' = absorbance of gelatinized section,

a = absorbance of blank of test section, and

a' = absorbance of blank of gelatinized section.

[0024]

The composition of the present invention can be used for producing the dough for foods such as the bakery food product and the noodles. By using the composition of the present invention as a part of dough raw materials, the dough having the moist texture or the chewy texture, the crispy texture, and the excellent melt-in-the-mouth texture can be produced. For example, the composition of the present invention and, as necessary, liquid are added to the dough raw materials (for example, cereal flour and auxiliary raw materials), and the mixture is kneaded to produce the dough. Alternatively, the raw materials and the liquid may be kneaded to produce intermediate dough, and the composition of the present invention may be added thereto and further kneaded to produce the dough. Preferably, effects of improving the texture of the dough by the composition of the present invention can be better exhibited when the composition of the present invention is kneaded and loosened in advance, then remaining dough raw materials are added thereto, and the liquid is added as necessary while kneading to produce the dough because the

composition of the present invention is well dispersed in the dough.

[0025]

Examples of the cereal flour contained in the dough raw materials include wheat flour, rye flour, barley flour, corn flour, rice flour, and a mixture of two or more thereof. These cereal flours may be unheated flour or the heat-treated flour. The cereal flour is preferably wheat flour, and more preferably unheated wheat flour. Examples of the wheat flour include the wheat flour usually used for food production, such as the hard wheat flour, the semi-hard wheat flour, the moderate wheat flour, the soft wheat flour, the whole-wheat wheat flour, the durum flour, and the mixture of two or more thereof. The types of the wheat flour used for the dough raw materials may vary depending on the types of the dough to be produced. For example, in the case of producing the bread dough, it is preferable to use the hard wheat flour, the semi-hard wheat flour, or mixed flour thereof.

[0026]

As the auxiliary raw materials contained in the dough raw materials, any one or two or more selected from the following can be used: auxiliary raw materials usually used in the production of the dough for the bakery food product or the noodles, for example, yeast (such as raw yeast and

dry yeast); yeast food; baking powder; saccharides such as sugar, glucose, fructose, converted sugar, sugar alcohol, starch syrup, maltose, and lactose; egg or egg powder; proteins such as gluten and egg white powder; processed or unprocessed starch; dextrin; dairy product such as skimmed milk powder, whole fat milk powder, cheese powder, and whey powder; fats and oils such as shortening, butter, margarine, and other animal and vegetable oils; additives such as emulsifiers, leavening agents, thickeners, sweeteners, flavors, colorants, and ascorbic acid; inorganic salts such as common salt; enzymes such as glucosidase, glucose oxidase, amylase, lipase, hemicellulase; dietary fibers; and the like. Examples of the liquid used in the production of the dough include an edible water such as a fresh water or a purified water, milk, and fruit juice.

[0027]

A content of the composition of the present invention in the dough raw materials may vary depending on the types of the dough to be produced. For example, the solid content of the composition of the present invention in the total solid content of a finally produced dough may be preferably from 2 to 50 mass%, more preferably from 3 to 40 mass%, and further preferably from 4 to 30 mass%. A content of the cereal flour and the auxiliary raw materials

in the dough raw materials may also vary depending on the types of the dough to be produced. For example, the content of the cereal flour may be 20 to 95 mass% in the total solid content of the finally produced dough.

[0028]

The dough food products such as the bakery food product and the noodles can be produced from the dough containing the composition of the present invention. The method for producing the dough food product according to the present invention can be performed according to conventional production methods for the dough food product except that the dough containing the composition of the present invention is prepared.

[0029]

In one example, production of the bakery food product according to the present invention can be performed according to various conventional methods such as a straight method, a sponge and dough method, a rapid growth method, Poolish sponge method, and a frozen dough method. For example, in a case of the sponge and dough method, the composition of the present invention may be added at either a sponge and dough stage or a dough mixing stage; however, it is preferably added at the dough mixing stage. Next, the dough for the bakery food product containing the composition of the present invention is fermented as

necessary, further molded by the conventional methods, and then heated, whereby producing the bakery food product. Examples of the heating method include baking, steaming, and frying (oil frying). Alternatively, in the present invention, the obtained dough for the bakery food product may be refrigerated or frozen as it is or in a state of being fermented or molded, and thawed and heated as necessary to produce the bakery food product.

[0030]

In another example, production of the noodles according to the present invention can be performed according to various conventional methods such as a roll noodle-making method and an extruded noodle-making method. Obtained raw noodles may be cooked as they are, or may be refrigerated or frozen. Alternatively, the raw noodles may be refrigerated or frozen after being cooked. Alternatively, the obtained raw noodles may be dried by conventional methods to produce dried noodles.

Examples

[0031]

The following will describe the present invention in detail with reference to the examples; however, the present invention is not limited to the examples below.

[0032]

(Production Example 1) Production of composition for bakery food product

The water (20 parts by mass) was added to 100 parts by mass of soft wheat flour (produced by Nisshin Foods) to prepare a mixture, and the mixture was fed to an extruder and stirred at 50°C for 20 minutes to prepare a heat-moisture-treated wheat flour. The obtained heat-moisture-treated wheat flour was cooled, and then 100 parts by mass of the water (about 25°C) was added to 100 parts by mass of the heat-moisture-treated wheat flour and stirred to prepare a mixture. The mixture was put in a heat-resistant aluminum pouch, degassed and sealed, then placed in a retort oven, and subjected to the pressure-and-heat treatment at 120°C for 15 minutes. After releasing heat from the pouch after the pressure-and-heat treatment, contents were taken out from the pouch to prepare a composition for a bakery food product. A part of the obtained composition for the bakery food product was taken, and the gluten vitality (GV) and the gelatinization degree were measured. Results are shown in Table 1.

[0033]

(Production Examples 2 to 11) Production of composition for bakery food product

The composition for the bakery food product was produced in the same manner as in Production Example 1

except that conditions for the heat-moisture treatment or conditions for the pressure-and-heat treatment were changed as shown in Table 1. A part of the composition for the bakery food product was taken, and GV and the gelatinization degree were measured. Results are shown in Table 1.

[0034]

(Comparative Examples 1 to 2)

The water (20 parts by mass) was added to 100 parts by mass of soft wheat flour (produced by Nisshin Foods; Comparative Example 1) or hard wheat flour (produced by Nisshin Foods; Comparative Example 2) to a mixture, and the mixture was fed to an extruder and stirred at 160°C for 20 minutes to prepare a heat-moisture-treated wheat flour. The obtained heat-moisture-treated wheat flour was cooled, and then 100 parts by mass of the water (about 25°C) was added to 100 parts by mass of the heat-moisture-treated wheat flour and stirred, and the obtained mixture was used as the composition for the bakery food product. A part of the composition for the bakery food product was taken, and GV and the gelatinization degree were measured. Results are shown in Table 1.

[0035]

(Production Example 12) Production of composition for bakery food product

Soft wheat flour (produced by Nisshin Foods) (100 parts by mass) was fed to an extruder with no water added and stirred at 50°C for 20 minutes to prepare a dry-heat-treated wheat flour. The obtained dry-heat-treated wheat flour was cooled, and then 100 parts by mass of the water (about 25°C) was added to 100 parts by mass of the dry-heat-treated wheat flour and stirred to prepare a mixture. The mixture was put in a heat-resistant aluminum pouch, degassed and sealed, then placed in a retort oven, and subjected to the pressure-and-heat treatment at 120°C for 15 minutes. After releasing heat from the pouch after the pressure-and-heat treatment, contents were taken out from the pouch to prepare a composition for a bakery food product. A part of the composition for the bakery food product was taken, and GV and the gelatinization degree were measured. Results are shown in Table 2.

[0036]

(Production Examples 13 to 22) Production of composition for bakery food product

A composition for a bakery food product was produced in the same manner as in Production Example 12 except that conditions for the dry-heat treatment or conditions for the pressure-and-heat treatment were changed as shown in Table 2. A part of the composition for the bakery food product was taken, and GV and the gelatinization degree were

measured. Results are shown in Table 2.

[0037]

(Comparative Example 3)

Soft wheat flour (produced by Nisshin Foods) (100 parts by mass) was fed to an extruder with no water added and stirred at 160°C for 20 minutes to prepare a dry-heat-treated wheat flour. The obtained dry-heat-treated wheat flour was cooled, and then 100 parts by mass of the water (about 25°C) was added to 100 parts by mass of the dry-heat-treated wheat flour and stirred, and the obtained mixture was used as a composition for a bakery food product. A part of the composition for the bakery food product was taken, and GV and the gelatinization degree were measured. Results are shown in Table 2.

[0038]

(Comparative Example 4)

To 100 parts by mass of soft wheat flour (produced by Nisshin Foods), 100 parts by mass of the water (about 25°C) was added and stirred to prepare a mixture. The mixture was put in a heat-resistant aluminum pouch, degassed and sealed, then placed in a retort oven, and subjected to the pressure-and-heat treatment at 120°C for 15 minutes. After releasing heat from the pouch after the pressure-and-heat treatment, contents were taken out from the pouch to prepare a composition for a bakery food product. A part of

the composition for the bakery food product was taken, and GV and the gelatinization degree were measured. Results are shown in Table 3.

[0039]

(Comparative Examples 5 to 6)

To 100 parts by mass of soft wheat flour (produced by Nisshin Foods), 100 parts by mass of the water (about 25°C) was added and stirred to prepare a mixture. The mixture was placed in a heat-resistant aluminum pouch, and the pouch was subjected to the heat treatment at 95°C for 5 minutes or 60 minutes by warming it in hot water while the pouch was opened. After releasing heat from the pouch after the heat treatment, contents were taken out from the pouch to prepare a composition for a bakery food product. A part of the composition for the bakery food product was taken, and GV and the gelatinization degree were measured. Results are shown in Table 3.

[0040]

(Comparative Examples 7 to 8)

Soft wheat flour (produced by Nisshin Foods) (100 parts by mass) was fed to an extruder with no water added and stirred at 160°C for 20 minutes to prepare a dry-heat-treated wheat flour. The obtained dry-heat-treated wheat flour was cooled, and then 100 parts by mass of the water was added to 100 parts by mass of the dry-heat-treated

wheat flour and stirred to prepare a mixture. The mixture was placed in a heat-resistant aluminum pouch, and the pouch was subjected to the heat treatment at 95°C for 5 minutes or 60 minutes by warming it in hot water while the pouch was opened. After releasing heat from the pouch after the heat treatment, contents were taken out from the pouch to prepare a composition for a bakery food product. A part of the composition for the bakery food product was taken, and GV and the gelatinization degree were measured. Results are shown in Table 3.

[0041]

(Test Example 1) Production of bread

Using bread raw materials below containing the composition for the bakery food product of the Production Examples or the Comparative Examples, bread rolls were produced by the straight method. First, the composition for the bakery food product was put in a bowl and loosened well so as to spread. Remaining bread raw materials were added thereto and mixed in a mixer at a low speed for 3 minutes, a medium speed for 5 minutes, and the low speed for 2 minutes in such an order to prepare the bread dough. The bread dough was fermented at a humidity of 75% and a temperature of 27°C for 60 minutes, then divided, molded, fermented for 60 minutes, and baked in an oven at 210°C for 15 minutes to produce bread rolls. Each of the bread rolls

was allowed to cool to a room temperature and then eaten by 10 trained panelists, and texture of the bread was evaluated. Evaluation was performed according to evaluation criteria below, and average values of evaluation results of the 10 panelists were obtained. Results are shown in Tables 1 to 3.

<Bread raw materials>

- Composition for bakery food product: 15 parts by mass
- Hard wheat flour (Camellia; produced by Nisshin Foods): 45 parts by mass

- Yeast: 0.5 parts by mass
- Yeast food: 0.2 parts by mass
- Sugar: 5 parts by mass
- Salt: 2 parts by mass
- Margarine: 5 parts by mass
- Whole egg: 5 parts by mass
- Water: balance

Total: 100 parts by mass

[0042]

<Evaluation criteria>

(Moist texture)

5 points: the moist texture of being stuck to lips is sufficient, which is extremely good

4 points: the moist texture of being stuck exists, which is good

3 points: no dryness; however, slight moist texture exists

2 points: the moist texture is insufficient, slightly dry, slightly brittle, which is poor

1 point: the moist texture is insufficient, dry, texture of brittleness is strong, which is extremely poor

(Crispy texture and melt-in-the-mouth texture)

5 points: there is no texture of clinging in the mouth at all, the crispy texture is very good, which is extremely good

4 points: there is minor texture of clinging in the mouth; however, the crispy texture is good, which is good

3 points: there is slight texture of clinging in the mouth; however, the crispy texture exists

2 points: there is slight texture of clinging in the mouth, the crispy texture is slightly inferior, which is poor

1 point: there is the texture of clinging in the mouth, the crispy texture is inferior, which is extremely poor

[0043]

[Table 1]

	Production example											Comparative example	
	1	2	3	4	5	6	7	8	9	10	11	1	2
Conditions for heat-moisture-treatment of wheat flour Temperature (°C)	50	60	100	160	200	240	100	100	100	100	100	160	160

Time (mins)	20	20	20	20	20	20	20	20	20	20	20	20	20
Conditions for pressure-and-heat treatment of mixture													
Temperature (°C)	120	120	120	120	120	120	50	105	130	140	150	N/A	N/A
Time (mins)	15	15	15	15	15	15	15	15	15	15	15		
Properties of composition													
GV (%)	37	30	19	8	3	3	40	19	15	11	7	28	30
Gelatinization degree (%)	73	73	74	76	77	78	24	38	79	81	83	14	14
Texture of bread													
Moist texture	3.7	4.2	4.3	4.5	4.6	4.3	3.2	3.4	4.4	4.4	4,1	1.9	1.8
Crispy texture, Melt-in-the-mouth texture	3.3	3.8	4.0	4.5	4.2	3.9	3.3	3.6	4.1	4.2	4.3	2.4	2.2

[0044]

[Table 2]

	Production example											Comparative example
	12	13	14	15	16	17	18	19	20	21	22	3
Conditions for dry-heat treatment of wheat flour												
Temperature (°C)	50	60	100	160	200	240	100	100	100	100	100	160
Time (mins)	20	20	20	20	20	20	20	20	20	20	20	20
Conditions for pressure-and-heat treatment of mixture												
Temperature (°C)	120	120	120	120	120	120	50	105	130	140	150	N/A
Time (mins)	15	15	15	15	15	15	15	15	15	15	15	
Properties of composition												
GV (%)	38	32	21	10	6	5	42	20	16	13	9	37
Gelatinization degree (%)	69	70	71	73	75	77	21	36	76	78	80	8
Texture of bread												
Moist texture	3.7	4.3	4.4	4.6	4.7	4.4	3.1	3.5	4.5	4.5	4,3	1.9
Crispy texture, Melt-in-the-mouth texture	3.3	4.0	4.2	4.7	4.4	4.1	3.4	3.8	4.3	4.4	4.5	2.5

[0045]

[Table 3]

	Comparative example				
	4	5	6	7	8
Conditions for heat treatment of wheat flour Temperature (°C) Time (mins)	N/A	N/A	N/A	Dry-heat 160 20	Dry-heat 160 20
Conditions for heat treatment of mixture Temperature (°C) Time (mins)	Pressurized 120 15	Non-pressurized 95 5			
Properties of composition GV (%) Gelatinization degree (%)	42 68	54 52	52 65	28 53	27 67
Texture of bread Moist texture Crispy texture, Melt-in-the-mouth texture	2.6 1.7	2.2 1.5	2.3 1.4	2.5 2.3	2.6 2.5

CLAIMS

1. A composition for a bakery food product obtained by subjecting a mixture containing heat-treated wheat flour and water to pressure-and-heat treatment.
2. The composition according to claim 1, wherein the heat-treated wheat flour is heat-moisture-treated wheat flour or dry-heat-treated wheat flour.
3. The composition according to claim 1 or 2, wherein gluten vitality of the composition for the bakery food product is from 0 to 30%.
4. The composition according to any one of claims 1 to 3, wherein a gelatinization degree of the composition for the bakery food product is from 40 to 100%.
5. A method for producing a composition for a bakery food product, comprising subjecting a mixture containing heat-treated wheat flour and water to pressure-and-heat treatment.
6. The method according to claim 5, wherein the heat-treated flour is heat-moisture-treated wheat flour or dry-heat-treated wheat flour.
7. The method according to claim 5 or 6, wherein the mixture is a mixture of 100 parts by mass of raw materials containing the heat-treated wheat flour and 50 to 200 parts by mass of the water.
8. The method according to any one of claims 5 to 7,

wherein the pressure-and-heat treatment is heat treatment at 50 to 200°C for 5 to 120 minutes in a sealed state.

9. The method according to any one of claims 5 to 8, wherein gluten vitality of the composition for the bakery food product is from 0 to 30%.

10. The method according to any one of claims 5 to 9, wherein a gelatinization degree of the composition for the bakery food product is from 40 to 100%.

11. A method for producing a bakery food product, comprising:

preparing a dough comprising:

the composition for the bakery food product according to any one of claims 1 to 4; or

the composition for the bakery food product produced by the method according to any one of claims 5 to 10.

12. The method according to claim 11, wherein a solid content of the composition for the bakery food product in a total solid content of the dough is from 2 to 50 mass%.

13. The method according to claim 11 or 12, wherein the dough further contains wheat flour.

14. The method according to any one of claims 11 to 13, further comprising heating the prepared dough.

15. A bakery food product comprising:

the composition for the bakery food product according to any one of claims 1 to 4; or

the composition for the bakery food product produced by the method according to any one of claims 5 to 10.