

SPECIFICATION

DUMPLING WRAPPER AND METHOD FOR PRODUCING THE SAME

5 TECHNICAL FIELD

[0001]

The present invention relates to an invention concerning a dumpling wrapper, and more specifically, the invention relates to a technology for providing a dumpling wrapper in which a hardening
10 even in the case of being subjected to storage after heating cooking is suppressed.

BACKGROUND ART

[0002]

15 Dumplings are popular food items as Chinese side dishes, and there are numerous commercial products in a cooked form that is supplied immediately after being cooked at restaurants and homes, as well as in a side dish form such as refrigerated foods and chilled foods. Furthermore, regarding the eating form of dumplings, it is
20 often assumed that a dumpling which has been once cooked with heat is stored until the time of eating, and then this is reheated in a microwave oven or the like for eating.

Here, there is a problem that in a freshly-prepared dumpling immediately after heating cooking, its wrapper is soft and have a
25 good texture and taste, whereas in a case where dumpling is stored at normal temperature or refrigerated until eating and then is reheated in a microwave oven or the like, its wrapper undergoes

hardening, and the texture is severely degraded.

[0003]

Here, regarding a technology intended for preventing the above-described hardening of dumpling wrappers during storage, for example, a technology of blending trehalose into the raw material powder for dumpling wrapper is disclosed in Patent Document 1. However, since the technology according to Patent Document 1 is a technology for adding a sugar compound that is also used as a sweetener to a dumpling wrapper, there is a concern that sugar molecules may affect the flavor and the like.

[0004]

Furthermore, in Patent Document 2, regarding a technology for preventing hardening of the peripheral portion of the wrapper for ingredient-wrapped dough sheet foods such as gyoza, a technology for blending an acetylated distarch phosphate (esterified starch) and a hydroxypropylated starch (etherified starch) to dumpling at 90:10 to 20:80 is disclosed.

However, while Patent Document 2 is recognized as a technology intended for solving the problems of preventing hardening and maintaining the texture upon reheating such as microwave oven cooking (paragraph 0007 of Patent Document 2, and the like), regarding the example of reheating that is actually disclosed in Patent Document 2, only the evaluation results of microwave oven cooking immediately after "frozen storage" after baking of pan-fried gyoza is shown. Thus, the problems related to changes in the physical properties of the wrapper after being stored at room temperature and in a refrigeration temperature range, where hardening is likely to proceed, and the

solutions for the problems cannot be identified (paragraphs 0045 to 0048 of Patent Document 2, and the like).

[0005]

Furthermore, the present applicant has been developing a
5 technology for applying a coating agent containing a high-amylose
starch (Patent Document 3), in connection with an enhancement of the
taste of conventional gyoza wrappers, and this technology is a
technology aimed at enhancing the crispy feeling of pan-fried gyoza
by applying the above-mentioned agents on the wrappers of pan-fried
10 gyoza, and is not intended to provide a solution to the above-described
problems.

RELATED DOCUMENT

PATENT DOCUMENT

15 [0006]

[Patent Document 1] Japanese Laid-Open Patent Publication No.
2004-141026

[Patent Document 2] International Publication No. WO
2017/131167

20 [Patent Document 3] Japanese Laid-Open Patent Publication No.
2002-306140

SUMMARY OF THE INVENTION

TECHNICAL PROBLEM

25 [0007]

The present invention was achieved in view of the circumstances
of the above-described related art technologies, and an object of

the invention is to provide a technology for producing a dumpling wrapper that can be easily applied in a production process for a dumpling wrapper and a hardening being suppressed even in the case of being subjected to storage after heating cooking.

5 SOLUTION TO PROBLEM

[0008]

The present inventors repeatedly conducted investigation in view of the above-described situation, and upon producing dumpling wrappers, the inventors prepared dumpling wrappers by blending a
10 predetermined amount of an etherified starch in addition to wheat flour at the time of preparing a dough thereof. Surprisingly, the inventors found that a dumpling wrapper which, even in a case where the dumpling wrapper has been stored at normal temperature or refrigerated after heating cooking is performed, is soft and gives
15 a texture with a satisfactory feeling on the tongue and a satisfactory feeling of food going down a throat even at the time of being subjected to heating in a microwave oven thereafter, can be produced.

[0009]

Furthermore, the present inventors further conducted an
20 investigation and found that the effect related to this suppression of hardening is an effect that is not exhibited in a processing treatment based on acetylation or esterification such as phosphoric acid crosslinking, and the effect is exhibited by etherification. That is, it was found that the effect related to this suppression
25 of hardening after heating cooking is an effect that is characteristically exhibited in etherified starch and is an effect that is exhibited even in a starch which has been overlappingly

subjected to other processing treatments.

[0010]

Here, in Patent Document 1 as described above, various forms of processed starches such as gelatinized, etherified, esterified, and crosslinked are exemplified (paragraph 0037 of Patent Document 1); however, the invention disclosed in Patent Document 1 relates to a technical idea focusing on trehalose and the prevention of hardening of wrappers. Furthermore, there is no formulation example of an etherified starch in the Examples, and it cannot be identified the above-described effect characteristic of etherified starch from such a confused description of enumerated processed starches.

In addition, in paragraph 0039 of Patent Document 1, it is described that "when a gyoza wrapper is subjected to a plurality of processes that easily induce hardening of the gyoza wrapper, such as a heat treatment, storage until eating, and reheating in a microwave oven, (... skipped ...) even with an ether-processed starch, the effect of preventing hardening is not recognized in most cases". In this point of view, it has been acknowledged that Patent Document 1 describes matters which hinder any conception leading to the present invention.

[0011]

Furthermore, in Patent Document 2, regarding a solution to the problems of preventing hardening and maintaining the texture upon reheating such as microwave oven cooking, provided is a technology for which it is essential to blend two kinds of processed starches, namely, an esterified starch and an etherified starch, and it has been shown through experimental results that in a case where "only"

an etherified starch is included, a stiffness at the time of microwave oven cooking is deteriorated to a large extent, and the texture is markedly deteriorated (paragraph 0051 (Table 2), paragraphs 0058 to 0060, and the like of Patent Document 2). Furthermore, the
5 experimental results of Patent Document 2 show that also in a case where one kind of starch is subjected to two kinds of processing, namely, etherification and esterification, the texture is similarly deteriorated. In this regard, it has been acknowledged that the formulation example of an etherified starch in Patent Document 2 is
10 a description that hinders any conception leading to the present invention.

Here, the deterioration of texture caused by the etherified starch as shown in Patent Document 2 is a result of the changes in the physical properties of the wrapper in a case where dumpling that
15 had been baked and then "frozen-stored" were directly cooked in a microwave oven (paragraphs of 0045 to 0048 and the like of Patent Document 2); however, on the other hand, Patent Document 2 does not disclose an evaluation carried out in a case where dumpling was stored at room temperature and in a refrigeration temperature range, where
20 a retrogradation of the starch component in particular is likely to proceed, and were reheated in a microwave oven.

In addition, in Patent Document 2, formulation examples in which the ratio of the etherified starch is 8.26% by mass and 27.01% by mass with respect to the powder raw materials (wheat flour, starch,
25 and gluten) are disclosed (paragraph 0053, paragraph 0058, and the like of Patent Document 2). On the other hand, in the Examples according to the present specification, with regard to the problem

of the changes in the physical properties of the wrapper under the storage conditions mainly assumed in the present invention, in which the wrapper is more likely to undergo hardening, it is recognized that when the ratio of an etherified starch is less than 8.3% by mass with respect to the powder raw materials, the feeling on the tongue and the feeling of food going down the throat are deteriorated, and when the ratio is 27% by mass or more, the state of the surface and the dough sheet at the time of preparing the gyoza wrapper is markedly degraded (Test 4 in the present specification).

From the viewpoints described above, Patent Document 2 neither discloses nor suggests that an addition of an etherified starch serves as a solution to the problem of the suppression of hardening of dumpling wrappers as supposed by the present invention, and it cannot be identified that the suppression of hardening is an effect exhibited in a case where a blending amount is in an appropriate range with respect to the powder raw materials.

[0012]

The present inventors have completed the present invention based on the above-described findings. The present invention specifically relates to the inventions described below.

[0013]

[Item 1]

A mix powder for a dumpling wrapper, the mix powder including an etherified starch and wheat flour, in which a content of the etherified starch is equal to or more than 8.3% by mass and equal to or less than 26% by mass with respect to the mix powder.

[Item 2]

The mix powder according to item 1, in which a gelatinization initiation temperature of the etherified starch is 64°C or lower.

[Item 3]

The mix powder according to item 1 or 2, in which a raw material
5 starch of the etherified starch is one kind or two or more kinds selected from the group consisting of tapioca starch, potato starch, and waxy corn starch.

[Item 4]

The mix powder according to any one of items 1 to 3, in which
10 the mix powder contains the etherified starch in an amount of equal to or more than 9 parts by mass and equal to or less than 35 parts by mass with respect to 100 parts by mass of the wheat flour.

[Item 5]

The mix powder according to any one of items 1 to 4, in which
15 the mix powder is used for a dumpling wrapper that is to be stored after heating cooking.

[Item 6]

The mix powder according to any one of items 1 to 5, in which the mix powder has an effect of suppressing hardening of a dumpling
20 wrapper on the occasion of storage after heating cooking, and includes the etherified starch as an active ingredient of the mix powder.

[Item 7]

A dumpling wrapper including an etherified starch and wheat flour, in which the dumpling wrapper contains the etherified starch
25 in an amount of equal to or more than 8.3% by mass and equal to or less than 26% by mass with respect to powder raw materials of the dumpling wrapper.

[Item 8]

The dumpling wrapper according to item 7, in which a content of the etherified starch in the dumpling wrapper is equal to or more than 5.9% by mass and equal to or less than 19% by mass.

5 [Item 9]

A method for suppressing hardening of a dumpling wrapper on the occasion of storage after heating cooking,

in which at the time of preparing a dough for a dumpling wrapper containing wheat flour, an etherified starch is included in an amount
10 of equal to or more than 8.3% by mass and equal to or less than 26% by mass with respect to powder raw materials of the dumpling wrapper.

[Item 10]

The method for suppressing hardening according to item 9, in which the storage is one or two selected from storage at normal
15 temperature and refrigerated storage.

[Item 11]

A method for producing a dumpling wrapper obtainable by including an etherified starch and wheat flour,

in which the etherified starch is included in an amount of equal
20 to or more than 8.3% by mass and equal to or less than 26% by mass with respect to powder raw materials of the dumpling wrapper at the time of preparing a dough for the dumpling wrapper.

[Item 12]

A method for producing a dumpling wrapper, the method including
25 using the mix powder according to any one of items 1 to 6.

[Item 13]

A method for producing a dumpling, the method including: using

the dumpling wrapper according to item 7 or 8 or a dumpling wrapper obtained by the method according to item 11 or 12.

[Item 14]

The method according to item 13, including a step of wrapping
5 a portion or an entirety of stuffing in the dumpling wrapper.

[Item 15]

The method according to item 13 or 14, in which the dumpling is a gyoza, a shumai, a xiaolongbao, or a Chinese steamed bun.

[Item 16]

10 The method according to any one of items 13 to 15, in which the dumpling is a pan-fried gyoza.

ADVANTAGEOUS EFFECTS OF INVENTION

[0014]

15 In the present invention, a technology for producing a dumpling wrapper that can be generally applied in a production process for dumpling wrappers and a hardening being suppressed even in the case of being subjected to storage after heating cooking, can be provided.

In particular, a dumpling wrapper that gives a soft and
20 satisfactory texture even in a case where a dumpling cooked with heat is stored at normal temperature or refrigerated, where the dumpling is more likely to undergo hardening, and then is reheated in a microwave oven at the time of eating, can be provided.

25 BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

[Fig. 1] A result chart showing the TA value (maximum stress

value) of a gyoza wrapper produced in Test 2, the TA value being measured after storage and reheating (D1) of the gyoza wrapper.

[0016]

[Fig. 2] A photograph of a gyoza wrapper produced in Test 4,
5 the photograph imaging the peripheral portion of the wrappers in a state of being overlapped immediately after being punched from a dough sheet.

DESCRIPTION OF EMBODIMENTS

10 [0017]

Hereinafter, embodiments of the present invention will be described in detail; however, the technical scope of the present invention is not intended to be limited to an aspect that includes all the configurations described below. Furthermore, the technical
15 scope according to the present invention does not exclude an aspect that includes a configuration other than the configuration described below, unless advantageous effects provided by the technical features according to the present invention are substantially impeded.

The present application is a patent application claiming
20 priority based on Japanese Patent Application No. 2018-049290 filed in Japan by the present applicant, the entire disclosure of which is incorporated herein by reference.

[0018]

1. Mix powder for dumpling wrapper

25 The present invention relates to a mix powder for a dumpling wrapper, which has an effect of suppressing hardening against storage after heating cooking.

The wrapper mix powder of the present invention is a wrapper mix powder to be used in the production of a dumpling wrapper, and is a mix powder for a dumpling wrapper including an etherified starch and wheat flour.

5 [0019]

Regarding the form of the wrapper mix powder according to the present invention, forms of wrapper mix powder for all stages that are assumed in a preparation process and a production process for the production of a gyoza wrapper are included. Here, the term "mix
10 powder" as used in the present specification refers to a powder raw material composition in a state in which powder-based raw materials to be put into the dough have been blended in advance. In the present invention, it is possible to put in powder raw materials collectively and to perform dough preparation conveniently, by putting in the
15 wrapper mix powder according to the present invention at the time of preparing a dough.

Here, regarding the form of the wrapper mix powder, for example, a state of a mixed powder obtained by blending a powdered etherified starch into wheat flour, and a state of a mixed powder obtained by
20 further blending other raw materials into wheat flour and an etherified starch, may be mentioned.

The state of the mix powder according to the present invention is preferably a state in which two or more powder raw materials are uniformly mixed; however, a mix powder in a state including a partially
25 non-uniform portion is also allowed as the mix powder of the present invention. Furthermore, a product which exists as a set product that is subdivided into respective powders before use, and which is

uniformly mixed at the time of use to acquire a form of a mix powder, is also included in the embodiment used for carrying out the present invention.

[0020]

5 Wheat flour

The wrapper mix powder according to the present invention includes wheat flour as a powder raw material. That is, it is necessary to blend wheat flour as at least a portion among the flours to be blended in the present invention. Here, the term "flour" refers
10 to a general one as a powdered processed product of cereals; however, as the flour to be blended in the present invention, it is desirable that substantially all or all of the flour is wheat flour, from the viewpoints of texture and taste.

The content of the wheat flour suitable for the wrapper mix powder
15 according to the present invention is 70% by mass or more, and preferably 80% by mass or more, with respect to the wrapper mix powder, and more preferably, the content is even more preferably 90% by mass or more.

Here, as the upper limit of the wheat flour content in the present
20 invention, a value obtainable by subtracting the proportion of processed starch from the total amount of the powder raw materials may be mentioned.

Regarding the wrapper mix powder according to the present invention, specifically, it is preferable that the content of wheat
25 flour with respect to the powder raw materials is within the above-described numerical value range.

[0021]

Regarding the kind of wheat flour, when the content of wheat flour is in the above-described range, any wheat flour can be used without particular limitation for the wrapper mix powder according to the present invention. For example, it is preferable to use wheat
5 flours classified into hard flour, semi-hard flour, and medium strength flour; however, it is also possible to use wheat flour classified as soft flour.

Incidentally, in a case where the content of wheat flour is less than the above-described range, and in a case where an extensibility,
10 stickiness, and the like of the dough are weak, it is also possible to improve the characteristics of the dough by making up the shortfall of wheat flour by separately blending gluten to the wrapper mix powder of the present invention.

[0022]

15 Etherified starch

The wrapper mix powder according to the present invention contains an etherified starch as a powder raw material. In the dumpling wrapper according to the present invention, since an etherified starch is included, hardening of the wrapper is suppressed
20 even in a case where the dumpling wrapper is stored after heating cooking.

In particular, regarding the effect of the etherified starch according to the present invention, even in a case where reheating by a microwave oven or the like after being stored at normal
25 temperature or under refrigerating conditions, where hardening is likely to occur after heating cooking, it is possible to realize a dumpling wrapper that is soft and has a satisfactory texture such

as the feeling on the tongue and the feeling of food going down the throat.

[0023]

(Form of etherification)

5 The etherification applied to starch in the present invention may be etherification of a hydroxyl group of a starch molecule with a hydroxyalkyl group and/or a carboxyalkyl group. Particularly, considering that the starch is used as a food additive, etherification with a hydroxypropyl group and/or a carboxymethyl group is preferred,
10 and etherification with a hydroxypropyl group is more preferable.

 The etherified starch according to the present invention includes not only processed starches that have been subjected to etherification processing only (hydroxypropylated starch, carboxymethylated starch, or the like), but also processed starches
15 that have been subjected to etherification and other processing treatments.

 Here, examples of the processing treatment applied in combination with etherification include esterification, crosslinking (phosphoric acid crosslinking, adipic acid
20 crosslinking), gelatinization, oxidation, and acid treatment, which are employed singly or in combination. As an example of the embodiment, hydroxypropylated distarch phosphate or the like may be mentioned; however, the processing treatment is not particularly limited to this.

25 [0024]

 Examples of a raw material starch for the etherified starch according to the present embodiment include one kind or two or more

kinds selected from tapioca starch, potato starch, and waxy corn starch, and the raw material starch is preferably one kind or two kinds selected from tapioca starch and potato starch.

[0025]

5 (Degree of etherification processing)

Regarding the processed starch according to the present invention, as the degree of processing of the etherified starch is higher, a superior function of suppressing hardening during storage is imparted to the gyoza wrapper.

10 [0026]

The degree of etherification processing of the processed starch according to the present invention can be indicated using the gelatinization initiation temperature that is in an opposite correlation with the degree of processing. For example, in a case
15 where the gelatinization initiation temperature has a low value, it is implied that the starch is a highly processed etherified starch. In contrast, in a case where the gelatinization initiation temperature has a high value, it is implied that the starch is a low-processed etherified starch.

20 The gelatinization initiation temperature for the processed starch according to the present invention is preferably 64°C or lower, from the viewpoint that the effect of suppressing hardening at the time of storage as supposed by the present invention. In particular, a gelatinization initiation temperature of 60°C or lower, more
25 preferably 58°C or lower, even more preferably 55°C or lower, and still more preferably 52°C or lower, which represents a medium to high degree of processing, is more suitable. The lower limit of the

gelatinization initiation temperature is not particularly limited; however, for example, the gelatinization initiation temperature may be 30°C or higher, preferably 40°C or higher, and more preferably 45°C or higher.

5 [0027]

Here, the gelatinization initiation temperature is a temperature at which gelatinization of starch begins, and can be found by measuring the viscosity exhibited by gelatinization. The viscosity can be measured using, for example, a BRABENDER VISCOGRAPH
10 E or an equivalent measuring apparatus.

[0028]

(Content of etherified starch)

From the viewpoint that the above-described effect of suppressing hardening in the dumpling wrapper, the content of the
15 etherified starch adequate for the wrapper mix powder of the present invention is suitably 8.3% by mass or more, preferably 8.5% by mass or more, and more preferably 8.7% by mass or more, and particularly preferably, the content is suitably 9% by mass or more.

In a case where the content is too small, the feeling on the
20 tongue, the feeling of food going down the throat, and the like of the wrapper that is subjected to storage and reheating will be inferior, and the overall texture will be unsatisfactory. Thus, the problems supposed by the present invention cannot be solved. Furthermore, regarding the content of the etherified starch, in a case where the
25 content is too large, shaping of the dough sheet is not easily achieved, a surface of the dough sheet becomes rough, and thus, the dumpling wrapper is in an unfavorable state. Therefore, it is desirable that

the upper limit of the content is 26% by mass or less, preferably 25% by mass or less, more preferably 20% by mass or less, even more preferably 15% by mass or less, and still more preferably 12% by mass or less, with respect to the wrapper mix powder.

5 Regarding the wrapper mix powder according to the present invention, specifically, it is preferable that the content of the etherified starch with respect to the powder raw materials is within the above-described numerical value range.

[0029]

10 In addition, from the viewpoint that the above-described effect of suppressing hardening is exhibited in the dumpling wrapper, and from the viewpoints of shaping of the dough sheet and the state of the wrapper surface, the content of the etherified starch in the wrapper mix powder of the present invention is preferably equal to
15 or more than 9 parts by mass and equal to or less than 35 parts by mass, more preferably equal to or more than 9.2 parts by mass and equal to or less than 15 parts by mass, and even more preferably equal to or more than 9.2 parts by mass and equal to or less than 11.5 parts by mass, with respect to 100 parts by mass of the wheat flour.

20 [0030]

As to other raw materials

 Regarding the wrapper mix powder of the present invention, in addition to the above-mentioned wheat flour and etherified starch, various materials, compounds, and the like that are usually blended
25 as a dough for a dumpling wrapper can be blended. For example, flours other than wheat flour (powders of cereals and beans, such as rice flour, corn flour, and soybean flour); powdered seasonings such as

salt; gluten; and powdered fats and oils can be blended; however, the other raw materials are not particularly limited to these. Furthermore, regarding the blending amounts of these raw materials, amounts appropriate for the dough of a dumpling wrapper can be employed
5 by a conventional method.

In addition, regarding the wrapper mix powder of the present invention, in addition to the above-described various materials, compounds, and the like that are conventionally blended, it is also possible to blend other materials, additives, and the like as long
10 as they do not cause problems concerning the effect of preventing hardening and the characteristics of the dumpling wrapper, or as food raw materials.

Furthermore, a processed starch other than an etherified processed starch, or a native starch that has not been subjected to
15 a processing treatment can also be blended into the wrapper mix powder of the present invention. Here, the other processed starch may be, for example, a starch that has been subjected to treatments such as gelatinization, oxidation, and an acid treatment, singly or in combination.

20 [0031]

2. Dumpling wrapper and method for producing the same

In the present invention, it is possible to produce a dumpling wrapper that is capable of solving the problems supposed by the present invention, by producing a dumpling wrapper with a dough containing
25 an etherified starch and wheat flour as will be described below.

[0032]

Dumpling wrapper

The dumpling wrapper according to the present invention includes an etherified starch such that the content of the etherified starch is in a predetermined range, from the viewpoint that the above-described effect of suppressing hardening as supposed by the present invention is sufficiently exhibited, and from the viewpoints of shaping of the dough sheet and the state of the wrapper surface.

[0033]

From the viewpoint that the above-described effect of suppressing hardening in the dumpling wrapper is exhibited, the content of the etherified starch in the dumpling wrapper of the present invention is suitably 8.3% by mass or more, preferably 8.5% by mass or more, and more preferably 8.7% by mass or more, with respect to the powder raw materials, and particularly preferably, the content is more suitably 9% by mass or more.

Furthermore, from the viewpoint of workability at the time of shaping dough sheet, it is desirable that the upper limit of the content of the etherified starch in the dumpling wrapper is 26% by mass or less, preferably 25% by mass or less, more preferably 20% by mass or less, even more preferably 15% by mass or less, and still more preferably 12% by mass or less, with respect to the powder raw materials.

[0034]

Regarding the content of the etherified starch in the dumpling wrapper according to the present invention, from the viewpoint that the above-described effect of suppressing hardening is sufficiently exhibited, and from the viewpoints of shaping of the dough sheet and the state of the wrapper surface, it is suitable that the content

is within a predetermined range of content ratio with respect to the total amount of the dough of the dumpling wrapper.

From this viewpoint, the content of etherified starch in the dumpling wrapper is preferably 5.9% by mass or more, more preferably 5 6% by mass or more, and even more preferably 6.3% by mass or more, with respect to the total amount of the dumpling wrapper, and still more preferably, it is suitable that the content is 6.8% by mass or more.

Furthermore, from the viewpoint of workability at the time of 10 shaping the dough sheet, the upper limit of the content of the etherified starch in the dumpling wrapper is preferably 19% by mass or less, more preferably 17% by mass or less, and even more preferably 14% by mass or less, with respect to the total amount of the dumpling wrapper, and still more preferably, it is suitable that the content 15 is 10% by mass or less.

[0035]

From a similar viewpoint as described above, regarding the content of the etherified starch in the dumpling wrapper according to the present invention, it is preferable that the etherified starch 20 is included in an amount of equal to or more than 9 parts by mass and equal to or less than 35 parts by mass, more preferably equal to or more than 9.2 parts by mass and equal to or less than 15 parts by mass, and even more preferably equal to or more than 9.2 parts by mass and equal to or less than 11.5 parts by mass, with respect 25 to 100 parts by mass of wheat flour.

[0036]

Regarding the shape of the dumpling wrapper of the present

invention, it is possible to produce the dumpling wrapper by shaping the dumpling wrapper into a shape appropriate for the stuffing or the like according to the desired dumpling. Examples of an embodiment include planar shapes such as a circular shape, a rectangular shape, and a polygonal shape; however, the shape is not particularly limited to these.

Regarding the thickness of the dumpling wrapper, the thickness can be adjusted to a suitable thickness according to the desired dumpling; however, when strength and the like in the case of wrapping dumpling are taken into consideration, the wrapper thickness may be 0.2 mm or more, and preferably 0.4 mm or more. Furthermore, in consideration of the texture as the dumpling wrapper, and the like, the wrapper thickness may be 5 mm or less, preferably 2 mm or less, and more preferably 1.5 mm or less.

[0037]

Method for producing dumpling wrapper

The dumpling wrapper of the present invention can be obtained by producing the dumpling wrapper through various processes such as dough preparation, dough sheet production, and shaping of dumpling wrapper. Furthermore, it is possible to obtain the dumpling wrapper by shaping the dough sheet that will be described below into a shape appropriate for a dumpling wrapper.

[0038]

Regarding the production process for a dumpling wrapper according to the present invention, the process can be carried out by techniques that are conventionally used as the method for producing a dumpling wrapper, except that the above-described raw materials

described in Section 1. are used. Regarding the production process for the dumpling wrapper according to the present invention, there are no particular limitations on the order of introducing the raw materials upon dough preparation; however, it is suitable that the
5 above-mentioned mix powder is prepared in advance and is introduced at the time of dough preparation.

According to an embodiment, a production method in which while wheat flour, an etherified starch, and table salt are mixed, other raw materials such as emulsified oils and fats and water are added
10 thereto, thus a dough that will be described later is prepared, the dough is let stand or rolled to produce a dough sheet, this is shaped into a circular shape, a rectangular shape, or the like, and thereby a dumpling wrapper is obtained, may be mentioned.

Regarding the method for producing a dumpling wrapper according
15 to the present invention, various processes such as dough preparation, dough sheet production, and shaping of a dumpling wrapper are not limited to these specific production methods, and any other known or novel techniques can also be employed. As a device for shaping the wrapper, punching using a mold against the dough sheet, spreading
20 of a beaded dough into a wrapper, and the like can be performed without any particular limitations.

In an invention relating to the method for producing a dumpling wrapper of the present invention, a step of blending or including an etherified starch in an amount in the above-mentioned
25 predetermined range is carried out as a step.

Here, the above-mentioned predetermined range can be applied by citing from or referring to the descriptions on the amount of

blending and the content in Section 1. or Section 2. Furthermore, also regarding specific embodiments and suitable embodiments, those embodiments can be applied by citing from or referring to the descriptions of Section 1. or Section 2.

5 [0039]

Dough and dough sheet

The present invention includes an invention relating to an intermediate product of the dumpling wrapper. That is, inventions relating to the dumpling wrapper dough and the dumpling wrapper dough
10 sheet produced in the above-described steps are included. Also included are inventions relating to a method for producing the dough and a method for producing the dough sheet.

[0040]

In the present invention, it is possible to produce a dumpling
15 wrapper having an effect of suppressing hardening upon storage after heating cooking, by using the dough or dough sheet. That is, the present invention includes an invention relating to a method for producing a dumpling wrapper, the method including using the dough or dough sheet.

20 [0041]

In the present specification, the term "dough" refers to a state in which water or other raw materials including moisture are introduced into and mixed with a mixture of the above-described various raw materials, and thereby a mixture including moisture is
25 formed. The recipe and composition can be appropriately changed according to the type of the dumpling wrapper. Furthermore, the dough may also be let stand or stored.

The shape of the dough according to the present invention can be freely changed and is not particularly limited. A "dough sheet" that has been subjected to rolling or the like into a thin strip shape, a sheet shape, a plate shape, a planar shape, or the like is also included in one form of the dough of the present invention.

[0042]

From the viewpoint that the effect of suppressing hardening supposed by the present invention is sufficiently exhibited, and from the viewpoints of shaping of the dough sheet and the state of the wrapper surface, the dough or dough sheet according to the present invention is a dough or dough sheet including an etherified starch such that the content of the etherified starch is in a predetermined range.

From this point of view, the content of the etherified starch included in the dough or dough sheet can be applied by citing from or referring to the descriptions related to the amount of blending and the content in the above-mentioned "Dumpling wrapper". Moreover, specific embodiments and suitable embodiments can also be applied by citing from or referring to the descriptions of the above-mentioned sections.

[0043]

3. Production of dumpling

The present invention includes an invention relating to a method for producing dumpling using the above-described dumpling wrapper. Also included is an invention relating to dumpling obtained by that production method.

[0044]

The method for producing dumpling of the present invention can be carried out by a technique that is conventionally used as a method for producing dumpling, except that the above-described dumpling wrapper is used. That is, the dumpling according to the present invention can be produced by a production method including a step of wrapping a portion or an entirety of stuffing in the dumpling wrapper as described above.

The wrapping form is not particularly limited, and the wrapping form can be determined as appropriate according to the type of dumpling, such as a form that wraps the entirety of the stuffing, a form that winds the stuffing into a roll form, or a form that wraps only a part of the stuffing. As an example of the embodiment, in conventional gyoza, the stuffing is placed at the center of a wrapper, and the stuffing is wrapped by folding the wrapper, and pressure-bonding the wrapper or adhering the wrapper by applying water or the like thereon so that the peripheral portions facing each other come into contact with each other. The stuffing to be wrapped is appropriately selected according to the type of the dumpling.

[0045]

The dumpling according to the present invention includes dumpling in various cooking stages and storage stages, such as raw dumpling before heating cooking, dumpling after heating cooking, dumpling produced by refrigerating this, and dumpling produced by freezing this.

Regarding the "dumpling" according to the present invention, preferably, specific embodiments such as a gyoza (jiaozi), a shumai, a xiaolongbao, and a Chinese steamed bun may be suitably mentioned.

Furthermore, foods other than these are also included in the dumpling according to the present invention, as long as they are acknowledged to be substantially equivalent to these.

Regarding the dumpling according to the present invention,
5 particularly preferably, pan-fried gyoza, boiled gyoza, shumai, and the like may be suitably mentioned, from the viewpoint of an eating form of performing conventional heating cooking (baking, steam heating, or the like), subsequent storage at normal temperature or refrigerated storage, where hardening is likely to proceed, and then
10 cooking in a microwave oven. In particular, pan-fried gyoza can be mentioned as an especially suitable embodiment.

[0046]

4. Functional characteristics

The dumpling wrapper according to the present invention becomes
15 a gyoza wrapper having excellent functional characteristics in which hardening is suppressed even when the dumpling wrapper is subjected to storage after heating cooking. In the dumpling wrapper according to the present invention, particularly, the effect of suppressing hardening upon storage after heating cooking and upon reheating
20 becomes satisfactory.

Furthermore, in the dumpling wrapper according to the present invention, even in a case where reheating in a microwave oven or the like is performed after storage at room temperature or refrigerated storage, where the dumpling wrapper is easily hardened, hardening
25 of the wrapper is suppressed, and the dumpling wrapper becomes a dumpling wrapper having functional characteristics such as a soft and satisfactory texture.

The functional characteristics are characteristics exhibited by employing the etherified starch included at the time of preparing the dough, as an active ingredient, and the functional characteristics are exhibited by forming the dough in a state of being
5 mixed with wheat flour.

According to the present invention, since the blending amount or the content of the etherified starch is in an appropriate range, an excellent dumpling wrapper having satisfactory flexibility and a satisfactory texture such as the feeling on the tongue and the
10 feeling of food going down the throat even in a case where the dumpling wrapper is subjected to the storage supposed by the present invention, is realized.

[0047]

Heating cooking, storage, and the like

15 The functional characteristics of the dumpling wrapper according to the present invention are exhibited particularly in a dumpling wrapper that has been subjected to storage where hardening is likely to proceed, after heating cooking. In a dumpling wrapper in which the etherified starch of the present invention is not included,
20 in a case where reheating is performed after storage under such conditions, the wrapper is hardened, and the texture is deteriorated. Particularly, at an ear portion of the portion where the wrapper is folded, hardening thereof and deterioration of the texture are noticeable.

25 [0048]

Here, the "heating cooking" by which the functional characteristics according to the present invention are exhibited,

refers to a heat treatment for realizing eating, and refers to a heating treatment that enables eating by heating raw dumpling, refrigerated dumpling, frozen dumpling, and the like. Specific examples include common cooking techniques such as baking (baking),
5 steam heating (steaming), boiling heating (simmering and boiling), and deep-frying (frying), and baking is preferred, while baking after steam heating is more preferred.

[0049]

Furthermore, the "storage" by which the functional
10 characteristics according to the present invention are exhibited, refers to being laid under the conditions in which hardening proceeds between the above-mentioned heating cooking and eating. Situations of being laid under the conditions include distribution, storage, and the like associated with sales at convenience stores,
15 supermarkets, and the like; however, storage in the room or the like performed by general consumers until eating after purchase is also included in this storage.

This storage preferably refers to storage at normal temperature or refrigerated storage. Here, the storage at normal temperature
20 refers to, for example, storage at a temperature of higher than 10°C and equal to or lower than 40°C. Refrigerated storage refers to, for example, storage at a temperature of higher than 0°C and equal to or lower than 10°C (including chilled storage at a temperature at which freezing does not occur, low-temperature storage that does
25 not use a refrigerating apparatus, and the like). Under such storage conditions, generally, hardening of the dumpling wrapper is likely to proceed after heating cooking.

Furthermore, the time for this storage is usually assumed to be storage for about several hours to several days; however, a storage mode of a short time of several dozen minutes or a long time of several weeks is also acceptable.

5 [0050]

Furthermore, the "reheating" suitable for exhibiting the functional characteristics according to the present invention refers to a treatment of subjecting dumpling after the above-described storage to reheating for the purpose of eating.

10 This reheating can be carried out by a general heating cooking technique (baking, steam heating, boiling heating, or the like) capable of heating food by a simple technique; however, regarding a reheating device by which the functional characteristics are easily exhibited, heating cooking by a microwave oven (microwaving treatment
15 or the like) may be mentioned. The reheating treatment in a microwave oven is a heating technique in which the moisture loss at the time of heating is large in the case of conventional dumpling wrappers, and hardening and deterioration of the texture are likely to proceed in conventional dumpling wrappers.

20 [0051]

Various methods

The present invention includes an invention relating to a method that utilizes the above-described functional characteristics. That is, the present invention includes an invention relating to a method
25 for suppressing hardening of a dumpling wrapper that is subjected to storage after heating cooking.

In the invention relating to this method, a step of blending

or including an etherified starch so that the etherified starch is included in an amount in the above-described predetermined range, is carried out as a step of the method.

Here, the predetermined range can be applied by citing from or
5 referring to the descriptions on the blending amount and the content in the above-described Section 1. or Section 2. Furthermore, also regarding the specific embodiments and suitable embodiments, those embodiments can be applied by citing from or referring to the descriptions of Section 1. or Section 2.

10 Furthermore, the invention of a method relating to the above-described functional characteristics according to the present invention also includes inventions relating to a method for suppressing deterioration in the flexibility of a dumpling wrapper upon storage, a method for suppressing deterioration in the texture,
15 and the like.

[0052]

Hereinafter, the present invention will be described by way of Examples; however, the scope of the present invention is not intended to be limited to these.

20 In the following examples, unless stated otherwise, the unit "%" represents "% by mass". Furthermore, in the evaluation of the following tables, the part indicated by the symbol "-" implies that the evaluation was not achieved because the evaluation is infeasible or particularly unnecessary.

25 [0053]

[Preparation Example] "Preparation of various raw materials"
Various raw materials were arranged and prepared on the occasion

of preparing a dough for a dumpling wrapper in the following tests.

[0054]

(Powder raw materials)

Component (A): wheat flour, semi-hard flour (TOKU NUMBER ONE,
5 manufactured by Nisshin Flour Milling, Inc.)

Component (B): Starch

(B-1): Highly processed hydroxypropylated tapioca starch
(etherified starch, gelatinization initiation temperature 50.5°C,
NATIONAL 78-0510, manufactured by Ingredion, Inc.)

10 (B-2): Hydroxypropylated potato starch (etherified starch,
gelatinization initiation temperature 55°C, JELCALL B0-15,
manufactured by J-Oil Mills, Inc.)

(B-3): Medium-processed hydroxypropylated tapioca starch
(etherified starch, gelatinization initiation temperature 59°C,
15 JELCALL POT-05, manufactured by J-Oil Mills, Inc.)

(B-4): Low-processed hydroxypropylated tapioca starch
(etherified starch, gelatinization initiation temperature 64°C,
prepared in this Example)

(B-5): Acetylated tapioca starch (esterified starch,
20 gelatinization initiation temperature 58°C, ACTBODY A-700,
manufactured by J-Oil Mills, Inc.)

(B-6): Distarch phosphate from tapioca starch (esterified
starch, not gelatinizing, ACTBODY TP-4W, manufactured by J-Oil Mills,
Inc.)

25 (B-7): Hydroxypropylated distarch phosphate from tapioca starch
(etherified and esterified starch, gelatinization initiation
temperature 58°C, JELCALL TP0-8, manufactured by J-Oil Mills, Inc.)

(B-8): Hydroxypropylated distarch phosphate from waxy corn starch (etherified and esterified starch, gelatinization initiation temperature 58°C, JELCALL A-18, manufactured by J-Oil Mills, Inc.)

(Table salt): Table salt having a product quality that is
5 generally used in the preparation of dough sheet was used.

[0055]

(Other raw materials)

Regarding emulsified oils and fats, SUPER FRIENDY M
(manufactured by Riken Vitamin Co., Ltd.) was used. Regarding water,
10 water having a product quality that is generally used for the
preparation of dough sheet was used.

[0056]

Among the above-described starches, (B-4) was prepared by the
following procedure.

15 212 g of water was added to 170 g of tapioca starch, a slurry
having a dry matter reduced mass concentration of 39% by mass was
prepared, and 37.2 g of sodium sulfate was added thereto.

The pH of the slurry thus obtained was adjusted to 6 with a 3%
aqueous solution of sodium hydroxide under stirring, subsequently
20 0.651 ml of a 13.0% aqueous solution of sodium hypochlorite was added
thereto, and sterilization was performed at 30°C for 60 minutes. The
sterilized slurry was adjusted to pH 11.5 with a 3% aqueous solution
of sodium hydroxide under stirring, 7.64 g of propylene oxide was
added thereto, and the mixture was reacted at 30°C for 7 hours. The
25 reaction product was washed with water, dehydrated, and dried, and
thus the etherified tapioca starch of (B-4) was obtained.

[0057]

The gelatinization initiation temperature of starch was measured by the following method.

(Method of measuring gelatinization initiation temperature)

The gelatinization initiation temperature of each starch was measured with BRABENDER VISCOGRAPH E (manufactured by Brabender GmbH & Co KG). Starch was introduced into a beaker containing 450 mL of distilled water so as to obtain a concentration of 6% in terms of dry matter, and after stirring, the starch slurry was transferred into a metal cylindrical container attached to the apparatus. While a stirrer rod (blade type) attached to the apparatus was rotated at a rate of 75 rotations/minute, the starch solution was heated, and while the temperature was increased at an increment of 1.5°C in one minute, the viscosity of the starch solution was measured. The temperature at which the viscosity of the starch solution reached 10 BU was designated as gelatinization initiation temperature.

[0058]

[Test 1] "Investigation on production of gyoza wrapper and composition of processed starch"

A gyoza wrapper having wheat flour and etherified starch blended therein was produced, and an evaluation on the storage as gyoza using the wrapper was carried out.

[0059]

(1) Production of gyoza

A gyoza wrapper and gyoza using this wrapper were produced according to the following procedure and the formulations shown in the following tables.

Component (A) and component (B) were combined in advance, and thus a mix powder was produced. The component (A) and the component (B) were blended as described in the tables for use.

The mix powder was introduced into a noodle maker (model: 5 HR2365/01, manufactured by Koninklijke Philips N.V.) and mixed, and table salt (1 g), emulsified oils and fats (1 g), and water (37 g) were introduced therein for 1 minute. Subsequently, mixing was performed for 8 minutes. Furthermore, raw materials adhering to the wall surface were dropped and mixed for 7 minutes, and a dough was 10 obtained.

The dough thus obtained was let stand for 30 minutes and then was roughly rolled into a thickness of 3 mm, this was compounded and was repeatedly subjected to a rolling treatment, and thereby a dough sheet having a final thickness of 1 mm was produced. The two sheets 15 of this dough sheet were stacked and punched out with a $\phi 8$ cm round gateaux mould, this was separated, and thus a gyoza wrapper having a diameter of about 8 cm was obtained.

As a control sample, a dough was prepared by the same method, except that only the component (A) and table salt were blended as 20 powder raw materials for the preparation of the dough, and the amount of water was adjusted to 35 g, and a gyoza wrapper was produced. [0060]

Raw gyoza was produced by wrapping 7 g of stuffing using the gyoza wrapper thus produced, and these were subjected to steam heating 25 for 8 minutes in a convection oven. These were left to stand at normal temperature for 15 minutes to cool down, and then the gyoza was left in a frozen state until baking was performed. Meanwhile, the gyoza

in this state was not yet subjected to baking process.

Ten pieces of the gyoza in a frozen state was arranged on an oiled hot plate at 200°C, 100 mL of water was added thereto, the gyoza was covered with a lid and steamed for 4 minutes, the gyoza was heated
 5 for another 2 minutes without the lid, and thus pan-fried gyoza that had been heated and baked was obtained.

[0061]

(2) Evaluation of wrapper in relation to storage at 25°C

The pan-fried gyoza produced as described above was evaluated
 10 for the state of the wrapper after 10 minutes of baking (D0). Furthermore, the pan-fried gyoza was left to stand for 4 hours at 25°C after baking and then was subjected to a reheating treatment in a microwave oven (500 W, for 1 minute), and an evaluation was performed 10 minutes thereafter. Thus, the state of the wrapper after
 15 storage and reheating (D1) was evaluated. Specific evaluation techniques for the present test are as follows.

[0062]

(TA evaluation)

With regard to the gyoza wrapper, the maximum stress (g) in a
 20 case where the ear portion of the wrapper, which is most likely to be hardened, was cut in a width of 5 mm, was measured using a texture analyzer. Here, as the maximum stress value (TA value) has a smaller value, it is implied that the wrapper is in a softer state. The equipment and measurement conditions used in this test are shown below.
 25 The results are presented in the following tables.

[0063]

Texture analyzer

Apparatus: TA-XT Plus (manufactured by Stable Micro Systems, Ltd.)

Plunger: LIGHT KNIEF BLADE (manufactured by Stable Micro Systems, Ltd.)

5 Width of contact between plunger and sample: 5 mm

Test speed: 0.3 mm/s

Measurement conditions: Measurement of 97% compressive stress, average of ten measurements

[0064]

10 As a result, in the gyoza wrappers produced by blending wheat flour and etherified starches (Examples 1 to 3), the TA value obtained after performing storage at normal temperature after heating and baking, followed by reheating, exhibited a lower value than a gyoza wrapper produced by blending only wheat flour as a principal powder
15 raw material (control). In these gyoza wrappers (Examples 1 to 3), the TA value after storage and reheating (D1) showed a value ranging from about 0.95 to 1.3 times the TA value immediately after baking (D0) (control: about 1.8 times). Thus, it was shown that hardening of the wrapper at the time of performing storage at normal temperature
20 after heating cooking, followed by reheating, was suppressed.

Furthermore, the change in the degree of hardening before and after the storage and reheating showed a smaller value as an etherified starch having a lower gelatinization initiation temperature of starch was blended, and even after the gyoza wrappers were subjected to
25 storage at normal temperature after heating cooking, followed by reheating, the wrappers were soft and were in a satisfactory state for eating.

In contrast, in the gyoza wrapper obtained by blending only wheat flour as a principal powder raw material (control), the TA value increased to a large extent after storage at normal temperature after heating and baking, followed by reheating, and it was found that the wrapper was in a hardened state.

[0065]

(3) Summary

As shown above, it was found that on the occasion of preparing a dough sheet for gyoza wrapper, when an etherified starch was blended in addition to wheat flour at the time of dough preparation, hardening of the gyoza wrapper was suppressed even if reheating was further carried out after heating cooking, and a gyoza wrapper that was soft and had a satisfactory texture was formed.

Here, "heating and baking" in the present test corresponds to conventional cooking processes for gyoza to be provided for eating, "storage at normal temperature" corresponds to a conventional state of storing until eating after cooking, and "reheating" corresponds to reheating in a microwave oven. Therefore, it was verified that the effect of suppressing hardening by the etherified starch was an effect that was satisfactorily exhibited in a situation in which conventional cooked gyoza was microwaved and then eaten.

Furthermore, in the etherified starches blended in Examples 1 to 3, it was shown that as the gelatinization initiation temperature was lower, the degree of etherification processing was higher. Therefore, it was verified that the effect of suppressing hardening of the wrapper as found in the present test was a phenomenon that was exhibited in correlation with the degree of etherification

processing of the starch to be blended into the dough.

[0066]

[Table 1]

			Control	Example 1	Example 2	Example 3
Dough	Powder raw materials	(A) Wheat flour	100g	90g	90g	90g
		(B) Starch (Type: Gelatinization initiation temperature)	0g	10g (B-3: 59°C)	10g (B-2: 55°C)	10g (B-1: 50.5°C)
		Table salt	1g	1g	1g	1g
	Emulsified oils and fats		1g	1g	1g	1g
	Water		35g	37g	37g	37g
	Total amount of dough		137g	139g	139g	139g
	Starch / powder raw materials		0%	9.9%	9.9%	9.9%
	Starch / total amount of dough		0%	7.2%	7.2%	7.2%
TA evaluation	(D0) Immediately after baking		1289.7g	1477.2g	1739.8g	1538.0g
	(D1) After storage and reheating		2295.3g	1947.1g	1696.5g	1454.8g
	D1/D0		1.78	1.32	0.98	0.95

[0067]

5 [Test 2] "Investigation on types of processed starch"

On the occasion of producing a gyoza wrapper having a processed starch blended therein, the influence exerted by the type of the processed starch on the wrapper at the time of storage after heating cooking was investigated.

10 [0068]

(1) Production of gyoza

Gyoza wrappers were produced by the same method as the method described in Test 1, except that the formulations described in Tables 2 and 3 were employed, and baked gyoza using these wrappers were
15 produced.

[0069]

(2) Various evaluations related to refrigerated storage

The pan-fried gyoza produced as described above was evaluated for the state of the wrapper after 10 minutes of baking (D0).

20 Furthermore, after baking, the pan-fried gyoza was left to stand

overnight under refrigerated conditions of 4°C, and then was subjected to a reheating treatment in a microwave oven (500 W, for 1 minute). After 10 minutes, evaluation was performed, and thereby the state of the wrapper after storage and reheating (D1) was evaluated.

5 Specific evaluation techniques for the present test are as follows.
[0070]

(TA evaluation)

Evaluation was carried out by the same method as the method used in Test 1, except that the state of the wrapper after storage under
10 refrigeration overnight and reheating (D1) was evaluated, and that the standard error of the average of 10 times of each value was calculated. The results are presented in Tables 2 and 3 and Fig. 1.

[0071]

15 (Sensory evaluation on softness of wrapper)

The texture related to the "softness of the wrapper" at the time of eating the wrapper portion of gyoza, was evaluated. Regarding the evaluation technique, evaluation was performed by three specialized panelists in five grades from 1 (hard) to 5 (soft), and
20 the average value of the scores was classified into four grades. In a case where this rating is "A" or "B", the wrapper is considered to be soft and have a satisfactory texture. Furthermore, in a case where this rating is "C", the wrapper is considered to feel slightly hard but have a texture that is in an acceptable range. Furthermore,
25 in a case where this rating is "D", the wrapper is considered to have a hard texture and is rated to be equivalent to Comparative Examples. The results are presented in the following tables.

[0072]

Classification of scores for sensory evaluation

"A": Equal to or higher than 4 and equal to or lower than 5

"B": Equal to or higher than 3 and lower than 4

5 "C": Equal to or higher than 2 and lower than 3

"D": Equal to or higher than 1 and lower than 2

[0073]

As a result, in the gyoza wrapper produced by blending wheat flour and an etherified starch (Example 4), it was found that even
10 in a case where the gyoza wrapper was subjected to refrigerated storage overnight after heating and baking, hardening of the wrapper after reheating thereof was suppressed, and the wrapper had a soft and suitable texture. Furthermore, the gyoza wrappers produced by blending a processed starch that had been subjected to both
15 esterification and etherification as the processed starch (Examples 5 and 6) were slightly inferior to the case in which a processed starch that had been subjected to etherification only was blended; however, it was found that hardening of the wrapper after being subjected to refrigerated storage after heating and baking, followed by reheating,
20 was suppressed, and the wrapper was soft and was in a state satisfactory for eating.

In contrast, in the gyoza wrappers produced by blending wheat flour and esterified starches (Comparative Examples 1 and 2), it was found that even in a case where the type of esterification was either
25 acetylation or phosphoric acid crosslinking, similarly to a gyoza wrapper as a control produced by blending only wheat flour as a principal powder raw material, the wrapper was in a hardened state

after storage after heating and baking, followed by reheating.

With regard to the type of the etherified starch, not only in the case in which the raw material starch was tapioca starch, but also in the case in which the raw material starch was corn starch, 5 the effect of suppressing hardening was confirmed (Example 6).

[0074]

(3) Summary

From the above results, it was found that when a gyoza wrapper was produced by blending an etherified starch, even in a case where 10 "refrigerated storage" was performed after baking, hardening of the gyoza wrapper after reheating was suppressed, and a gyoza wrapper having a soft and satisfactory texture was obtained.

Furthermore, the flexible and satisfactory texture was an effect that was not exhibited by esterification such as acetylation or 15 phosphoric acid crosslinking, and the effect was exhibited in a case where starch was subjected to etherification in duplicate in addition to esterification. That is, in a case where the gyoza wrapper was subjected to refrigerated storage after heating cooking, followed by reheating, it was verified that the effect of suppressing hardening 20 in the wrapper is an effect that is exhibited even by a starch that has been additionally subjected to another processing treatment, as long as the starch is a starch that has been subjected to etherification processing.

[0075]

[Table 2]

			Control	Example 4	Comparative Example 1	Comparative Example 2
Dough	Powder raw materials	(A) Wheat flour	100g	90g	90g	90g
		(B) Starch (Type: Gelatinization initiation temperature)	0g	10g (B-1: 50.5°C)	10g (B-5: 58°C)	10g (B-6: -)
		Table salt	1g	1g	1g	1g
	Emulsified oils and fats		1g	1g	1g	1g
	Water		35g	37g	37g	37g
	Total amount of dough		137g	139g	139g	139g
	Starch / powder raw materials		0%	9.9%	9.9%	9.9%
	Starch / total amount of dough		0%	7.2%	7.2%	7.2%
TA evaluation	(D1) After storage and reheating (maximum stress $\pm$ standard error)		1268.3 $\pm$ 135.3g	991.8 $\pm$ 115.9g	1297.5 $\pm$ 91.7g	1368.6 $\pm$ 87.6g
Sensory evaluation	Softness	(D0) Immediately after baking	C	A	C	D
		(D1) After storage and reheating	D	A	D	D

[0076]

[Table 3]

			Example 5	Example 6
Dough	Powder raw materials	(A) Wheat flour	90g	90g
		(B) Starch (Type: Gelatinization initiation temperature)	10g (B-7: 58°C)	10g (B-8: 58°C)
		Table salt	1g	1g
	Emulsified oils and fats		1g	1g
	Water		37g	37g
	Total amount of dough		139g	139g
	Starch / powder raw materials		9.9%	9.9%
	Starch / total amount of dough		7.2%	7.2%
TA evaluation	(D1) After storage and reheating (maximum stress $\pm$ standard error)		1049.6 $\pm$ 108.1g	-
Sensory evaluation	Softness	(D0) Immediately after baking	B	B
		(D1) After storage and reheating	B	B

[0077]

5 [Test 3] "Investigation on degree of ether processing of processed starch"

On the occasion of producing a gyoza wrapper by blending an etherified starch, the influence exerted by the degree of ether processing of the processed starch on the wrapper during storage after heating cooking was investigated.

[0078]

(1) Production of gyoza

Gyoza wrappers were produced by the same method as the method described in Test 1, except that the formulations described in the following tables were employed, and pan-fried gyoza using these
5 wrappers was produced. Meanwhile, the etherified starch blended in the present test represents a starch such that as the gelatinization initiation temperature of the starch is lower, the degree of etherification processing is higher.

[0079]

10 (2) Various evaluations related to refrigerated storage

For the pan-fried gyoza produced as described above, the state of the wrapper after 10 minutes of baking (D0) was evaluated. Furthermore, after baking, the pan-fried gyoza was left to stand overnight under refrigerated conditions of 4°C, and then was
15 subjected to a reheating treatment in a microwave oven (500 W, for 1 minute). After 10 minutes, evaluation was performed, and thereby the state of the wrapper after storage and reheating (D1) was evaluated.

In the present test, a sensory evaluation of the texture related
20 to the "softness of the wrapper" of the following item was performed by a technique similar to Test 2. The results are presented in the following tables.

[0080]

(Sensory evaluation on softness of wrapper)

25 The texture related to the "softness of the wrapper" at the time of eating the wrapper portion of gyoza, was evaluated.

As a result, in the gyoza wrappers produced by blending

etherified starches, hardening of the wrapper at the time of performing refrigerated storage after heating cooking, followed by reheating, was suppressed, and a satisfactory texture was obtained (Examples 4, 7, and 8), all compared to the control.

5 Regarding the extent of the suppression of hardening and the satisfactoriness of the texture, as the etherified starch had a lower gelatinization initiation temperature (that is, the degree of ether processing was higher), the wrapper showed a rating value representing a softer and more satisfactory texture. Particularly,
10 in gyoza wrappers produced by blending an etherified starch having a gelatinization initiation temperature of 59°C or lower, the effects related to the suppression of hardening and to a satisfactory texture were extremely satisfactory (Examples 4 and 7).

[0081]

15 (3) Summary

From the above results, it was shown that the effect related to suppression of hardening by blending an etherified starch was correlated with the degree of ether processing of the processed starch to be blended, and as the degree of processing was higher, a titer
20 became higher.

Regarding the degree of ether processing, it was found that a starch that had been subjected to ether processing at a medium to high degree (particularly, high-degree ether processing at 51°C or lower), by which the gelatinization initiation temperature became
25 59°C or lower, was suitable.

[0082]

[Table 4]

			Control	Example 4	Example 7	Example 8
Dough	Powder raw materials	(A) wheat flour	100g	90g	90g	90g
		(B) Starch (Type: Gelatinization initiation temperature)	0g	10g (B-1: 50.5°C)	10g (B-3: 59°C)	10g (B-4: 64°C)
		Table salt	1g	1g	1g	1g
		Emulsified oils and fats	1g	1g	1g	1g
	Water		35g	37g	37g	37g
	Total amount of dough		137g	139g	139g	139g
	Starch / powder raw materials		0%	9.9%	9.9%	9.9%
	Starch / total amount of dough		0%	7.2%	7.2%	7.2%
Sensory evaluation	Softness	(D0) Immediately after baking	C	A	A	B
		(D1) After storage and reheating	D	A	B	C

[0083]

[Test 4] "Investigation on mixing ratio of processed starch"

On the occasion of producing a gyoza wrapper having an etherified starch blended therein, the effect exerted by the mixing ratio of the processed starch on the wrapper was investigated in detail.

[0084]

(1) Production of gyoza

Gyoza wrappers were produced by the same method as the method described in Test 1, except that the formulations described in the following tables were employed, and pan-fried gyoza using these wrappers was produced.

[0085]

(2) Evaluation on state of wrapper upon production

With regard to the production process for the gyoza wrapper, the state of the wrapper related to the wrapper surface and the efficiency of punching was evaluated. Regarding the evaluation technique, evaluation was performed by three specialized panelists in five grades from 1 (poor) to 5 (good), and the average value of the scores was classified into four grades from "A" to "D".

Classification of the scores was performed in the same manner as in

Test 2.

In the present test, in a case where the rating is "A" or "B", the state of the wrapper is considered to be satisfactory. In a case where the rating is "C", the sample is considered to be in an acceptable
5 range with regard to this evaluation item; however, in a case where two or more "C"s are presented on the whole for a sample, the sample is considered to be equivalent to Comparative Examples from the viewpoint of the overall state of the wrapper. Furthermore, in a case where the rating is "D", it means that the sample is in a state
10 of being poor with regard to the evaluation item, and in a case where there is even a single rating of "D" for the entire sample, the sample is considered to be equivalent to Comparative Examples. The respective evaluation results are presented in the following tables.

[0086]

15 (Evaluation on surface roughness)

A state of a surface roughness of the wrapper immediately after punching from a rolled dough sheet was evaluated. As this evaluation was more satisfactory, the surface was smoother, and the texture upon eating became more satisfactory.

20 As a result of the evaluation, it was found that in a case where the etherified starch was blended in an amount of 24.8% by mass or less with respect to the powder raw materials (Comparative Examples 3 and 4, and Examples 9, 10, 4, and 11), a wrapper having a smooth and satisfactory wrapper surface after rolling and punching was
25 obtained. On the other hand, it was found that in a case where the etherified starch was blended in an amount of 26.7% by mass with respect to the powder raw materials (Comparative Example 5), the

operation itself of shaping the dough sheet was difficult, the surface was not smooth, and a rough wrapper was obtained.

[0087]

(Evaluation on releasability)

5 It was evaluated whether, at the time of punching out the wrapper using a die from a rolled dough sheet, a circular dough after die cutting was easily cut out and separated from the surrounding dough.

As a result of the evaluation, it was found that in a case where the etherified starch is blended in an amount of 8.4% by mass or more with respect to the powder raw materials (Examples 9, 10, 4, and 11 and Comparative Example 5), the dough was easily cut out, and the workability was satisfactory. On the other hand, it was found that in a case where the etherified starch is blended in an amount of 7.9% by mass or less with respect to the powder raw materials (Comparative
10 Examples 3 and 4), parts of the dough were not easily cut apart, and the die cutting operation was difficult.

[0088]

(Evaluation on adhesiveness between wrappers)

It was evaluated whether the overlapping wrappers that had been
20 punched out from a rolled dough sheet were easily separated without adhering to each other. A photographic image that captured a part of the result of the evaluation is shown in Fig. 2.

As a result of the evaluation, it was shown that in a case where the etherified starch is blended in an amount of 8.4% by mass or more with respect to the powder raw materials (Examples 9, 10, 4, and 11 and Comparative Example 5), the wrapper was firm, the wrappers were
25 easily separated, and the workability was satisfactory.

Particularly, in a case where the etherified starch was blended in an amount of 8.9% by mass or more, the separatory characteristics were much more satisfactory.

On the other hand, it was found that in a case where the etherified starch is blended in an amount of 7.9% by mass or less with respect to the powder raw materials (Comparative Examples 3 and 4), parts of the dough easily adhered to each other, and the operation after die cutting was difficult to perform.

[0089]

(3) Various evaluations on refrigerated storage

For the pan-fried gyoza produced as described above, the state of the wrapper after 10 minutes of baking (D0) was evaluated. Furthermore, after baking, the pan-fried gyoza was left to stand overnight under refrigerated conditions of 4°C, and then was subjected to a reheating treatment in a microwave oven (500 W, for 1 minute). After 10 minutes, evaluation was performed, and thereby the state of the wrapper after storage and reheating (D1) was evaluated. In Comparative Example 5, since the state of shaping of the dough sheet in (2) was obviously poor, a sensory evaluation was not carried out.

In the present test, a sensory evaluation on the "texture" of the following items was performed by three specialized panelists in five grades from 1 (poor) to 5 (good), and the average value of the scores was classified into four grades. Classification of the scores was performed in the same manner as in Test 2.

In a case where the rating is "B" or higher, the texture of the evaluation item is considered to be satisfactory. In a case where

the rating is "C", the texture related to the evaluation item is considered to be in an acceptable range. In a case where two or more "C"s are presented on the whole for a sample, from the viewpoint of the overall texture, the sample is considered to be equivalent to Comparative Examples. Furthermore, in a case where the rating is "D", the texture related to the evaluation item is poor, and in a case where there is even a single rating of "D" for the entire sample, the sample is considered to be equivalent to Comparative Examples. The respective evaluation results are presented in the following tables.

[0090]

(Sensory evaluation on softness of wrapper)

The texture related to the "softness of the wrapper" at the time of eating the wrapper portion of gyoza, was evaluated.

As a result of the evaluation, it was found that in a case where the etherified starch was blended in an amount of 8.4% by mass or more with respect to the powder raw materials, even if the gyoza wrapper was subjected to refrigerated storage overnight after heating and baking, hardening of the wrapper after reheating thereof was suppressed, and a gyoza wrapper having a soft and suitable texture was obtained (Examples 9, 10, 4, and 11). Particularly, in a case where the etherified starch was blended in an amount of 8.9% by mass or more (Examples 10, 4, and 11), a gyoza wrapper having a superior texture with softness after storage and reheating was obtained.

[0091]

(Sensory evaluation on feeling on tongue and smoothness)

The texture related to the "feeling on the tongue and smoothness"

at the time of eating the wrapper portion of gyoza was evaluated.

As a result of the evaluation, it was found that in a case where a wrapper was produced by blending the etherified starch in an amount of 8.4% by mass or more with respect to the powder raw materials, even if the wrapper was subjected to refrigerated storage overnight after heating and baking, a gyoza wrapper having a texture in which the feeling on the tongue and smoothness of the wrapper after reheating were suitable, was obtained (Examples 9, 10, 4, and 11). Particularly, in a case where the etherified starch was blended in an amount of 8.9% by mass or more (Examples 10, 4, and 11), a gyoza wrapper in which this texture was superior was obtained.

[0092]

(Sensory evaluation on feeling of food going down throat)

The texture related to the "feeling of food going down the throat" at the time of eating the wrapper portion of gyoza, was evaluated.

As a result of the evaluation, it was found that in a case where a wrapper was produced by blending the etherified starch in an amount of 8.9% by mass or more with respect to the powder raw materials, even if the wrapper was subjected to refrigerated storage overnight after heating and baking, a gyoza wrapper having a texture in which the feeling of food going down the throat at the time of eating after reheating of the wrapper was suitable, was obtained (Examples 10, 4, and 11).

Meanwhile, in a gyoza wrapper produced by blending the etherified starch in an amount of 8.4% by mass (Example 9), the texture related to the feeling of food going down the throat was evaluated to be slightly inferior; however, other evaluations were satisfactory,

and a comprehensive texture was satisfactory.

[0093]

(4) Summary

As can be seen from the above evaluation results, it was found
5 that in the case of producing a gyoza wrapper having an etherified
starch blended therein, when the etherified starch was blended in
an amount of 8.4% by mass or more with respect to the powder raw
materials (total amount of wheat flour, the above-described processed
starches, and table salt), a gyoza wrapper that was soft even in the
10 case of being subjected to storage and reheating and had a
comprehensively satisfactory texture, was able to be produced.
Particularly, in a case where the etherified starch was blended in
an amount of 8.9% by mass or more with respect to the powder raw
materials, a gyoza wrapper having an extremely satisfactory texture
15 after storage and reheating was obtained.

Furthermore, it was found that by blending the etherified starch
in an amount of 24.8% by mass or less with respect to the powder raw
materials (total amount of wheat flour, the above-described processed
starches, and table salt), a gyoza wrapper having a satisfactory state
20 of the wrapper surface immediately after being punched out from a
dough sheet, and having satisfactory workability for a punching
operation, was able to be produced. Among these, in a case where
the etherified starch was blended in an amount in the range of equal
to or more than 8.4% by mass and equal to or less than 24.8% by mass,
25 and particularly equal to or more than 8.9% by mass and equal to or
less than 24.8% by mass, with respect to the powder raw materials,
a gyoza wrapper having particularly satisfactory workability for a

wrapper punching operation was obtained.

[0094]

Here, the range of equal to or more than 8.4% by mass and equal to or less than 24.8% by mass (particularly, equal to or more than 8.9% by mass and equal to or less than 24.8% by mass) with respect to the powder raw materials (total amount of wheat flour, the above-described processed starches, and table salt), which were suitable mixing ratios for the etherified starch, was a range in which, when gyoza cooked with heat was stored and reheated, an effect of suppressing hardening was noticeably exhibited, and at the same time, a range in which the production efficiency at the time of producing a dough sheet and a wrapper was extremely satisfactory.

Meanwhile, a suitable range of the blending amount of the etherified starch in the present test was a range corresponding to equal to or more than 6.1% by mass and equal to or less than 18% by mass (particularly, equal to or more than 6.5% by mass and equal to or less than 18% by mass), when converted into a value with respect to the total amount of the dumpling wrapper (total amount of dough). Furthermore, when the blending amount was converted into a value with respect to 100 parts by mass of wheat flour, the range was a range equivalent to equal to or more than 9.3 parts by mass and equal to or less than 33.3 parts by mass (particularly, equal to or more than 9.9 parts by mass and equal to or less than 33.3 parts by mass).

[0095]

[Table 5]

			Control	Comparative Example 3	Comparative Example 4	Example 9	Example 10
Dough	Powder	(A) Wheat flour	100g	95g	92g	91.5g	91g

	raw materials	(B) Starch (Type: Gelatinization initiation temperature)	0g	5g (B-1: 50.5°C)	8g (B-1: 50.5°C)	8.5g (B-1: 50.5°C)	9g (B-1: 50.5°C)
		Table salt	1g	1g	1g	1g	1g
	Emulsified oils and fats		1g	1g	1g	1g	1g
	Water		35g	37g	37g	37g	37g
	Total amount of dough		137g	139g	139g	139g	139g
	Starch / powder raw materials		0%	5.0%	7.9%	8.4%	8.9%
	Starch / total amount of dough		0%	3.6%	5.8%	6.1%	6.5%
State of wrapper upon production	Surface roughness		-	B	B	B	B
	Releasability		-	C	C	B	B
	Adhesiveness		-	C	C	B	A
Sensory evaluation	Softness of wrapper	(D0) Immediately after baking	C	B	B	A	A
		(D1) After storage and reheating	D	B	B	B	A
	Feeling on tongue and softness	(D0) Immediately after baking	C	B	B	B	A
		(D1) After storage and reheating	D	C	C	B	B
	Feeling of food going down throat	(D0) Immediately after baking	C	B	B	B	A
		(D1) After storage and reheating	D	C	C	C	B

[0096]

[Table 6]

			Example 4	Example 11	Comparative Example 5
Dough	Powder raw materials	(A) wheat flour	90g	75g	73g
		(B) Starch (Type : Gelatinization initiation temperature)	10g (B-1:50.5°C)	25g (B-1:50.5°C)	27g (B-1:50.5°C)
		Table salt	1g	1g	1g
	Emulsified oils and fats		1g	1g	1g
	Water		37g	37g	37g
	Total amount of dough		139g	139g	139g
	Starch / powder raw materials		9.9%	24.8%	26.7%
	Starch / total amount of dough		7.2%	18.0%	19.4%
State of wrapper upon production	Surface roughness		B	B	D
	Releasability		B	B	B
	Adhesiveness		A	A	A
Sensory evaluation	Softness of wrapper	(D0) Immediately after baking	A	A	-
		(D1) After storage and reheating	A	A	-
	Feeling on tongue and softness	(D0) Immediately after baking	A	A	-
		(D1) After storage and reheating	A	B	-
	Feeling of food going down throat	(D0) Immediately after baking	A	A	-
		(D1) After storage and reheating	B	A	-

REFERENCE SIGNS LIST

[0097]

- 5 1: Gyoza wrapper
- 2: Peripheral portion

CLAIMS

1. A mix powder for a dumpling wrapper, the mix powder comprising an etherified starch and wheat flour, wherein a content of the etherified starch is equal to or more than 8.3% by mass and equal to or less than 26% by mass with respect to the mix powder.
2. The mix powder according to claim 1, wherein a gelatinization initiation temperature of the etherified starch is 64°C or lower.
3. The mix powder according to claim 1 or 2, wherein a raw material starch of the etherified starch is one kind or two or more kinds selected from the group consisting of tapioca starch, potato starch, and waxy corn starch.
4. The mix powder according to any one of claims 1 to 3, wherein the mix powder contains the etherified starch in an amount of equal to or more than 9 parts by mass and equal to or less than 35 parts by mass with respect to 100 parts by mass of the wheat flour.
5. The mix powder according to any one of claims 1 to 4, wherein the mix powder is used for a dumpling wrapper that is to be stored after heating cooking.
6. The mix powder according to any one of claims 1 to 5, wherein the mix powder has an effect of suppressing hardening of a dumpling wrapper on an occasion of storage after heating cooking, and comprises

the etherified starch as an active ingredient of the mix powder.

7. A dumpling wrapper comprising an etherified starch and wheat flour,
wherein the dumpling wrapper contains the etherified starch in an
5 amount of equal to or more than 8.3% by mass and equal to or less
than 26% by mass with respect to powder raw materials of the dumpling
wrapper.

8. The dumpling wrapper according to claim 7, wherein a content of
10 the etherified starch in the dumpling wrapper is equal to or more
than 5.9% by mass and equal to or less than 19% by mass.

9. A method for suppressing hardening of a dumpling wrapper on an
occasion of storage after heating cooking,
15 wherein at a time of preparing a dough for a dumpling wrapper
containing wheat flour, an etherified starch is included in an amount
of equal to or more than 8.3% by mass and equal to or less than 26%
by mass with respect to powder raw materials of the dumpling wrapper.

20 10. The method for suppressing hardening according to claim 9,
wherein the storage is one or two selected from storage at normal
temperature and refrigerated storage.

11. A method for producing a dumpling wrapper obtainable by including
25 an etherified starch and wheat flour,
wherein the etherified starch is included in an amount of equal
to or more than 8.3% by mass and equal to or less than 26% by mass

with respect to powder raw materials of the dumpling wrapper at a time of preparing a dough for the dumpling wrapper.

12. A method for producing a dumpling wrapper, the method comprising:
5 using the mix powder according to any one of claims 1 to 6.

13. A method for producing a dumpling, the method comprising: using the dumpling wrapper according to claim 7 or 8, or a dumpling wrapper obtained by the method according to claim 11 or 12.

10

14. The method according to claim 13, comprising a step of wrapping a portion or an entirety of stuffing in the dumpling wrapper.

15. The method according to claim 13 or 14, wherein the dumpling
15 is a gyoza, a shumai, a xiaolongbao, or a Chinese steamed bun.

16. The method according to any one of claims 13 to 15, wherein the dumpling is a pan-fried gyoza.