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Konjak-added foodstuffs

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KONJAK-ADDED FOODSTUFFS

The present invention relates to foodstuffs which contain konjak and to a process for preparing the same. More particularly, it relates to a process for preparing foodstuffs (such as hamburgers or the like) to which konjak is added without adversely affecting their taste. The foodstuffs are thereby rendered lower in calories.

Konjak has been utilized in food for many years. Most recently, attention has focused on the usefulness of konjak because of its non-calorie and/or dietary fibre properties.

However, it is true to say that konjak has so far been used mostly in a board-like form provided as daily food. No substantial use has been made of konjak as a material for processed foodstuffs, for example, to add konjak to other foodstuffs thereby to impart its peculiar texture to the foodstuff, to improve physical properties of foodstuffs or to use as a "liaison" or for calorie control.

One reason for this may be that the technology for adapting konjak raw materials, such as konjak powders, etc., for use as processed foodstuff ingredients or foodstuff additives has lagged behind.

According to a conventional method for preparing konjak, 900 to 1200 litres of water are added to about 30 kg of konjak powder, the resulting mixture is swollen to make konjak paste and from 3 to 6% of lime is then added to and mixed with the konjak powder. Subsequently, the mixture is placed in a container, a moulding box or the like and heated at a temperature of about 80°C for about 60 minutes to obtain konjak. This process has been used from old.

In cases where konjak powders are used as

food materials for other processed foodstuffs, etc., there have been adopted, for example, techniques of finely dividing konjak into powder and adding such fine konjak powder to the foodstuff, or swelling konjak in water and adding the resulting konjak paste, or adding lime to konjak and adding the resulting konjak paste.

However, these techniques are associated with problems. For example, the konjak mannan is not gelled even at the stage of final products so that the paste state remains, or a smell of slaked lime used as a solidifying agent for konjak remains, or the taste of the product deteriorates because the pH is inclined toward the alkaline side.

Accordingly, the amount of konjak which can actually be added to foodstuffs has hitherto been greatly limited - even though it would be desirable to add much greater amounts for the purposes of improving physical properties or controlling calorie counts.

As a result of extensive investigations into ways of adding konjak to foodstuffs without adversely affecting their taste, the present inventors have found that by adjusting the pH value of konjak paste to within the range of from 9.0 to 10.3, the problems of alkali taste or paste-like texture can be prevented.

According to the present invention there is provided a foodstuff comprising a mixture of a calorie containing component and a non-calorie containing component,

said non-calorie containing component consisting of from 1-50% of a water swollen unheated konjak paste,

said konjak paste consisting essentially

of konjak flour mixed with water and a basic amino acid, a basic salt, or a mixture thereof,

said konjak paste having a pH in the range of from 9.0 to 10.3.

The present invention further provides a process for producing a konjak-added foodstuff which comprises:

(a) forming an unheated konjak paste by mixing konjak flour, an amount of water sufficient to cause the konjak flour to swell and dissolve, and a basic amino acid, a basic salt, or a mixture thereof; adjusting pH of the resulting mixture to a range of from 9.0 to 10.3; and leaving the pH adjusted mixture to stand to cause the konjak flour to swell sufficiently;

(b) incorporating the konjak paste into a food or food material to provide a mixed foodstuff; and

(c) cooking the thus obtained konjak-containing mixed foodstuff.

It is necessary for the pH of the konjak paste to be within the range of from 9.0 to 10.3, preferably from 9.5 to 10.2. In a preferred embodiment, the thus-prepared konjak paste is allowed to stand at 20 to 25°C for at least 1.5 hours, more preferably for 2 to 4 hours, after the above-mentioned pH adjustment before being used.

Representative embodiments of the present invention for preparing pH-controlled konjak paste are described below.

(1) To konjak powder is added a 20 to 40-fold amount of water so as to swell and dissolve the konjak powder. Basic amino acids and basic salts are added to the resulting konjak paste. The mixture is thoroughly mixed. Alternatively;

(2) Basic amino acids and basic salts are

dissolved in water in an amount of 20 to 40 times that of konjak powder. The konjak powder is swollen and dissolved in the resulting solution.

Alternatively;

(3) Appropriate amounts of basic amino acids and basic salts are previously mixed with konjak powder. A 20 to 40-fold amount of water is then added to the resulting powdery mixture to swell and dissolve the konjak powder, the basic amino acids and basic salts therein.

In a manner as described above, konjak powder and alkali agents (i.e. the basic amino acids and basic salts) are swollen and dissolved to prepare konjak paste having a pH of from 9.0 to 10.3, more preferably a pH of from 9.5 to 10.2.

Suitable basic amino acids for use as the alkali agent in the present invention include arginine, histidine, lysine, citrulline and ornithine. Arginine and lysine are particularly preferred.

Any basic salts may be used so long as they are suitable for foodstuffs, but basic phosphates and organic acid salts are preferred. For example, sodium carbonate, sodium bicarbonate, calcium carbonate, disodium phosphate, trisodium phosphate, dicalcium phosphate, tripotassium phosphate, sodium polyphosphate, sodium citrate and sodium lactate, are most preferably used.

In order to give a buffering effect, acids such as citric acid or lactic acid, or acidic salts such as sodium dihydrogenphosphate or potassium dihydrogenphosphate may also be used in a suitable combination to finally adjust the pH of the konjak paste to a value within the range of from 9.0 to 10.3, preferably from 9.5 to 10.2.

According to the present invention, the alkali

agent is chosen from the basic salts for foodstuff additives described above and is used singly or in combination.

Since pH of konjak paste varies depending upon kind of the alkali agent, it is necessary that an amount required for the desired pH be previously determined by preparing konjak paste using an alkali agent.

In the present invention, 1 to 50% of konjak paste prepared to show a pH in a range of 9.0 to 10.3 is incorporated into raw food materials and the mixture is processed, whereby foodstuffs free of deterioration in taste due to alkali and substantially free of konjak-like texture or konjak paste-like texture can be obtained. Thus, excellent low calorie foodstuffs can be provided according to the present invention.

In the present invention, approximately 1 to 50% of konjak paste is added to raw food material such as meat for hamburger, meat for sausage, fish meat, etc. The mixture is then processed by heating, steaming, etc. to prepare konjak-added foodstuffs.

The konjak paste controlled to the pH range in accordance with the present invention can be added to various foodstuffs to make assistance in calorie control. In addition thereto, the konjak paste can be added to marine processed foodstuffs or meat processed foodstuffs to improve their taste, texture, water-retaining properties,

etc., or added to Chinese noodle, Japanese noodle, etc. to improve texture and otherwise physical properties or to use as liaison; alternatively, the konjak paste may be added to bread, cookie, etc. to improve texture, swellability and otherwise physical properties.

Next, test examples and examples of the present invention are given below.

Test Example

To 5.6 g of konjak powder was added 200 ml of sodium carbonate solution in a 0 to 0.5% concentration. While stirring, konjak was swollen and the mixture was allowed to stand at room temperature for 2 hours to swell konjak completely. The resulting alkaline konjak paste, 60 g, was mixed with 140 g of minced beef and 50 g of the mixture was shaped into a circle of a 8 cm diameter. A part of this hamburger pathe was baked, on a pan, as it was and another part was baked after freezing at -20 °C. Physical properties and taste of the hamburger were then examined. At the same time, pH of the alkaline konjak paste and hamburger pathe was determined.

The results are shown in Table 1 below.

Table 1 Results of pH Measurement and Physical Properties and Taste of Pathe

Concentration of Sodium Carbonate	pH of Alkaline Konjak Paste	pH of Hamburger Pathe	Physical Properties and Taste When Baked As It Was	Physical Properties and Taste When Baked After Freezing
0	6.60	6.10	x Konjak paste is not solidified but strong paste like taste.	x Konjak paste is not solidified but strong paste like taste.
0.1	8.92	6.23	x Same as above	x Same as above
0.15	9.36	6.30	x Same as above	o Konjak paste is solidified and has good texture.
0.2	9.62	6.36	Δ Konjak paste is not solidified but weak paste like taste.	o Same as above
0.25	9.78	6.46	o Konjak paste is solidified and has good texture.	o Same as above
0.3	9.94	6.47	o Same as above	o Same as above
0.35	10.05	6.59	o Same as above	o Same as above
0.4	10.11	6.66	o Same as above	o Same as above
0.45	10.14	6.88	Δ Konjak paste is solidified and has good texture. Somewhat weak alkali taste.	Δ Konjak paste is solidified and has good texture. Somewhat weak alkali taste.
0.5	10.30	6.94	x Same as above	x Same as above
0.6	10.40	7.00	x Alkali taste and unpleasant odor.	x Alkali taste and unpleasant odor.
0.8	10.50	7.21	x Same as above	x Same as above

Table 1 (continued)

Concentration of Sodium Carbonate	pH of Alkaline Konjak Paste	pH of Hamburger Pathe	Physical Properties and Taste When Baked As It Was	Physical Properties and Taste When Baked After Freezing
1.0	10.60	7.44	x Same as above	x Same as above

Beef alone: pH 6.01

Example 1

To 30 g of konjak powder was added 1000 ml of 0.3% sodium carbonate solution. While stirring, konjak was swollen and the mixture was allowed to stand at room temperature for further 2 hours to swell konjak completely. The pH of the konjak paste was 9.9. To 200 g of the resulting alkaline konjak paste was added 500 g of minced beef. The mixture was well mixed and shaped into 60 g of hamburger pathe of a 8 cm diameter. The hamburger pathe was good pathe having good texture.

This hamburger pathe was baked for tasting. It was delicious hamburger free of unpleasant odor and free of konjak-like texture.

Example 2

To 28 g of konjak powder was added 1000 ml of 0.2% sodium carbonate solution. While stirring, konjak was

swollen and the mixture was allowed to stand at room temperature for further 2 hours to swell konjak completely. The pH of the konjak paste was 9.6. To 300 g of the resulting alkaline konjak paste was added 700 g of salmon fish meat. The mixture was well mixed. After shaping into a piece of 5 cm ø 40 g, the piece was covered with a batter obtained by dissolving wheat powder in water and then with bread crumbs, which was freezed at -25 °C overnight in a refrigerator. It was a soft salmon fry free of unpleasant odor and free of dry texture.

Example 3

Minced pork, 1750 g, 100 g of lard and 52 g of table salt were mixed and stirred with a cutting mixer and 12 g of sugar, 7 g of sodium glutamate, 70 g of starch, 35 g of a smoking solution, 18 g of spice mixture (mixture of pepper, paprika, coriander, ginger, cinnamon, sage, onion mace) and 350 g of ice water were further added to the mixture. To the resulting meat mixture was added 600 g of alkaline konjak paste as prepared in Example 1. The mixture was further mixed and stirred and packed in a collagen casing for Vienna sausage. Boiling with hot water of 80 °C for 20 minutes gave Vienna sausage. The sausage was free of unpleasant odor and had soft texture.

While the invention has been described in detail and with reference to specific embodiments thereof, it is apparent to one skilled in the art that various changes and

modifications can be made therein without departing from the spirit and the scope of the invention.

CLAIMS

1. A foodstuff comprising a mixture of a calorie containing component and a non-calorie containing component,

said non-calorie containing component consisting of from 1-50% of a water swollen unheated konjak paste,

said konjak paste consisting essentially of konjak flour mixed with water and a basic amino acid, a basic salt, or a mixture thereof,

said konjak paste having a pH in the range of from 9.0 to 10.3.

2. A foodstuff as claimed in claim 1, wherein said basic amino acid comprises arginine or lysine, or a mixture thereof.

3. A foodstuff as claimed in claim 1 or claim 2, wherein said basic salt comprises a basic phosphate or organic acid salt, or a mixture thereof.

4. A foodstuff as claimed in any of the preceding claims, wherein said calorie containing component comprises meat or fish.

5. A process for producing a konjak-added foodstuff which comprises:

(a) forming an unheated konjak paste by mixing konjak flour, an amount of water sufficient to cause the konjak flour to swell and dissolve, and a basic amino acid, a basic salt, or a mixture thereof; adjusting pH of the resulting mixture to a range of from 9.0 to 10.3; and leaving the pH adjusted mixture to stand to cause the konjak flour to swell sufficiently;

(b) incorporating the konjak paste into a food or food material to provide a mixed foodstuff; and

(c) cooking the thus obtained konjak-

containing mixed foodstuff.

6. A process as claimed in claim 5, wherein said basic amino acid comprises arginine or lysine, or a mixture thereof.

7. A process as claimed in claim 5 or claim 6, wherein said basic salt comprises a basic phosphate or organic acid salt, or a mixture thereof.

8. A process as claimed in any of claims 5 to 7, wherein said konjak paste is left to stand at a temperature of from 20 to 25°C for at least 1.5 hours before being incorporated into the food or food material.

9. A process as claimed in any of claims 5 to 8, wherein said adjustment of the pH of the mixture to a range of from 9.0 to 10.3 involves the use of acids or acid salts, or a combination thereof.

10. A process as claimed in any of claims 5 to 9, wherein the food or food material comprises meat or fish.

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