

SPECIFICATION

[TITLE OF INVENTION] COATING MATERIAL FOR FRIED FOOD

5 TECHNICAL FIELD

[0001]

The present invention relates to a coating material for fried food.

10 BACKGROUND ART

[0002]

As a technique for inhibiting the flavor and texture of coating from deteriorating over time, a batter mix for a fried food containing a reversible thermosetting gelling agent and a reversible thermoplastic gelling agent is described in Patent Document 1 (Japanese Unexamined Patent Publication No. 2016-054664). According to Patent Document 1, in a case where the batter mix is used, even though the fried food is deep fried or heated in a microwave oven and then left to stand for a long period of time, the coating material remains as crisp and crunchy as it is just deep-fried.

Patent Document 2 (International Publication No. W02018/181749) describes a batter for deep-fried food containing cereal flour, a specific sugar, solid oil or fat, a thickener, and egg white, in which a mass ratio of the solid oil or fat to the cereal flour and a mass ratio of water to the cereal flour satisfy predetermined ranges. According to Patent Document 2,

using the batter makes it possible to accomplish both the excellent texture (mouthfeel and cohesion between the coating and the stuffing) and preferable appearance, in a case where the deep-fried food is heated and cooked in a microwave oven.

5

RELATED DOCUMENT

PATENT DOCUMENT

[0003]

[Patent Document 1] Japanese Unexamined Patent Publication

10 No. 2016-054664

[Patent Document 2] International Publication No.

W02018/181749

SUMMARY OF THE INVENTION

15 TECHNICAL PROBLEM

[0004]

However, in a case where the aforementioned techniques are used, there is still room for enhancement in improving the stickiness of coating to obtain a fried food with excellent texture even when the fried food cooked by heating is reheated after storage.

20

SOLUTION TO PROBLEM

[0005]

According to the present invention, there is provided a coating material for fried food described below.

25

[0006]

[1] A coating material for fried food, containing the

following component (A) and a cellulose derivative,

in which the coating material is for a batter or breader.

Component (A): a powdery granular material satisfying the following conditions (1) to (4)

5 (1) A starch content in the powdery granular material is 75% by mass or more.

(2) A content of a low-molecular-weight starch obtained from a starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery
10 granular material, and a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more and 5×10^4 or less.

(3) A cold water swelling degree of the powdery granular material at 25°C is 5 or more and 20 or less.

(4) A content of a fraction that passes through a sieve
15 having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.

[2] The coating material for fried food described in [1], in which the cellulose derivative is one compound or two or more
20 compounds selected from the group consisting of methyl cellulose, hydroxypropyl methyl cellulose, and carboxymethyl cellulose.

[3] The coating material for fried food described in [1] or [2], in which the cellulose derivative is hydroxypropyl methyl
25 cellulose.

[4] The coating material for fried food described in any one of [1] to [3], in which a content of the cellulose

derivative in the coating material is 0.5% by mass or more and 10.0% by mass or less with respect to a total solid content of the coating material.

[5] The coating material for fried food described in any
5 one of [1] to [4], in which a mass ratio of a content of the cellulose derivative in the coating material to a content of the component (A) in the coating material is 0.01 or more and 3.0 or less.

[6] The coating material for fried food described in any
10 one of [1] to [5], further containing one starch or two starches (excluding the component (A)) selected from the group consisting of oxidized starch and crosslinked starch.

[7] The coating material for fried food described in [6],
in which a mass ratio of a content of the starch to sum of a
15 content of the component (A) and a content of the cellulose derivative (starch/(component (A) + cellulose derivative)) is 0.5 or more and 9 or less.

[8] A batter containing the coating material described in any one of [1] to [7].

20 [9] A breeder containing the coating material described in any one of [1] to [7].

[10] A fried food including the coating material described in any one of [1] to [7].

[11] A manufacturing method of a fried food, including a
25 step of coating outside of stuffing with the batter described in [8], and

a step of heating and cooking the batter-coated stuffing.

[12] A manufacturing method of a fried food, including a step of coating outside of stuffing with the breader described in [9], and

a step of heating and cooking the breader-coated stuffing.

5 [13] The manufacturing method of fried food described in [11], further including

a step of coating the outside of the stuffing with the breader described in [9], before the step of heating and cooking.

10 [14] A method of improving texture of fried food, including a step of incorporating the following component (A) and a cellulose derivative into the coating material for fried food.

Component (A): a powdery granular material satisfying the following conditions (1) to (4)

15 (1) A starch content in the powdery granular material is 75% by mass or more.

(2) A content of a low-molecular-weight starch obtained from a starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery
20 granular material, and a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more and 5×10^4 or less.

(3) A cold water swelling degree of the powdery granular material at 25°C is 5 or more and 20 or less.

(4) A content of a fraction that passes through a sieve
25 having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.

[15] A method of improving texture in a case where fried food is reheated after storage, including a step of incorporating the following component (A) and a cellulose derivative into a coating material for fried food.

5 Component (A): a powdery granular material satisfying the following conditions (1) to (4)

(1) A starch content in the powdery granular material is 75% by mass or more.

(2) A content of a low-molecular-weight starch obtained
10 from a starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery granular material, and a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more and 5×10^4 or less.

(3) A cold water swelling degree of the powdery granular
15 material at 25°C is 5 or more and 20 or less.

(4) A content of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.

20

ADVANTAGEOUS EFFECTS OF INVENTION

[0007]

According to the present invention, a coating material for fried food can be provided which makes it possible to improve
25 the stickiness of coating and obtain fried food with excellent texture even though the fried food obtained by heating and cooking is reheated after storage.

DESCRIPTION OF EMBODIMENTS

[0008]

Hereinafter, embodiments of the present invention will be
5 described with specific examples of each component. As each
component, one substance can be used alone, or two or more
substances can be used in combination.

Furthermore, in the present embodiment, "stickiness of
coating" means that it is difficult to bite through food when
10 chewing the food, and "improving the stickiness of coating"
means easing the difficulty of biting through and enhancing
crispiness.

[0009]

(Coating material for fried food)

15 In the present embodiment, the coating material for fried
food contains the following component (A) and a cellulose
derivative.

(A) A powdery granular material satisfying the following
conditions (1) to (4)

20 Hereinafter, the component (A) and the cellulose derivative
will be more specifically described.

[0010]

(Component (A))

Specifically, the component (A) is a powdery granular
25 material containing starch as a main component. The component
(A) satisfies the following conditions (1) to (4).

(1) A starch content in the powdery granular material is

75% by mass or more.

(2) A content of a low-molecular-weight starch obtained from a starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery granular material, and a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more and 5×10^4 or less.

(3) A cold water swelling degree of the powdery granular material at 25°C is 5 or more and 20 or less.

(4) A content of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.

[0011]

Regarding the condition of (1), from the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, the starch content in the component (A) is 75% by mass or more, preferably 80% by mass or more, and even more preferably 85% by mass or more.

The upper limit of the starch content in the component (A) is not limited, and is 100% by mass or less. Depending on the properties and the like of the food to which the coating material for fried food is applied, the upper limit of the starch content may be 99.5% by mass or less, 99% by mass or less, and the like.

[0012]

The starch in the component (A) is, for example, starch for foods. It is possible to use starch derived from various sources. For example, as the starch, it is possible to appropriately select one or more starches from starch including
5 maize starch such as high-amylose corn starch, corn starch, and waxy corn starch, tapioca starch, sweet potato starch, potato starch, wheat starch, high-amylose wheat starch, rice starch, bean starch such as mung bean starch and pea starch, and sago palm starch, processed starch obtained by chemically,
10 physically, or enzymatically processing the above starch, and the like. From the viewpoint of enhancing workability in handling the coating material for fried food, the starch is preferably one starch or two or more starches selected from tapioca starch, maize starch, rice starch, and bean starch, and
15 more preferably one starch or two starches selected from tapioca starch and maize starch.

From the same viewpoint, the raw material from which the starch is derived is preferably one material or two or more materials selected from the group consisting of cassava, corn,
20 rice, and beans.

[0013]

Regarding the condition (2), the component (A) specifically contains low-molecular-weight starch and other starches. First, the low-molecular-weight starch will be described.

25 From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied and maintaining the crispy texture in a case where the food is

reheated after storage, the amylose content in the raw material starch of the low-molecular-weight starch is 5% by mass or more, preferably 12% by mass or more, more preferably 22% by mass or more, even more preferably 40% by mass or more, still more preferably 45% by mass or more, yet more preferably 55% by mass or more, and even more so preferably 65% by mass or more. The upper limit of the amylose content in the raw material starch of the low-molecular-weight starch is not limited. The upper limit is 100% by mass or less, preferably 90% by mass or less, and more preferably 80% by mass or less.

[0014]

For example, as the starch having an amylose content of 5% by mass or more that is the raw material of the low-molecular-weight starch, it is possible to use one starch or two or more starches selected from the group consisting of maize starch such as high-amylose corn starch, corn starch, and waxy corn starch, tapioca starch, sweet potato starch, potato starch, wheat starch, high-amylose wheat starch, rice starch, bean starch such as mung bean starch and pea starch, and sago palm starch, and processed starch obtained by chemically, physically, or enzymatically processing the above raw materials. From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, the starch having an amylose content of 5% by mass or more is preferably one starch or two or more starches selected from high-amylose corn starch, corn starch, tapioca

starch, and bean starch, and more preferably high-amylose corn starch. As the high-amylose corn starch, for example, starch having an amylose content of 40% by mass or more is available. The starch having an amylose content of 5% by mass or more is
5 more preferably a high-amylose corn starch having an amylose content of 40% by mass or more.

[0015]

From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied
10 and maintaining crispy texture in a case where the food is reheated after storage, the content of the low-molecular-weight starch in the component (A) is 3% by mass or more, preferably 8% by mass or more, and even more preferably 13% by mass or more. From the same viewpoint, the content of the low-molecular-weight
15 starch in the component (A) is 45% by mass or less, preferably 35% by mass or less, and more preferably 25% by mass or less.

[0016]

From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied
20 and maintaining crispy texture in a case where the food is reheated after storage, a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more, and preferably 8×10^3 or more. From the same viewpoint, the peak molecular weight of the low-molecular-weight starch is 5×10^4 or less,
25 preferably 3×10^4 or less, and more preferably 1.5×10^4 or less. The method of measuring the peak molecular weight of the low-molecular-weight starch will be described in the section of

Examples.

[0017]

From the viewpoint of excellent manufacturing stability of the low-molecular-weight starch, the low-molecular-weight starch
5 is preferably one starch or two or more starches selected from the group consisting of acid-treated starch, oxidized starch, and enzyme-treated starch, and more preferably acid-treated starch.

[0018]

10 The conditions of the acid treatment for obtaining acid-treated starch are not limited. For example, the acid treatment can be performed as follows.

First, starch as a raw material having an amylose content of 5% by mass or more and water are put in a reactor, and then
15 an acid is added thereto. Alternatively, acid water prepared by dissolving an inorganic acid in water and starch as a raw material are put in a reactor. From the viewpoint of more stably performing the acid treatment, it is desirable that the entirety of starch in the midst of reaction be uniformly
20 dispersed in a water phase or be in a state of slurry. In order for the starch to be in such a state, the concentration of the starch slurry during the acid treatment is adjusted such that the concentration of the slurry falls into a range of 10% by mass or more and 50% by mass or less for example, and preferably
25 falls into a range of 20% by mass or more and 40% by mass or less.

The concentration of the starch slurry during the acid

treatment is, for example, 10% by mass or more, and preferably 20% by mass or more. Furthermore, the concentration of the starch slurry is, for example, 50% by mass or less, and preferably adjusted to fall into a range of 40% by mass or less.

5 In a case where the concentration of the slurry is too high, the slurry viscosity may increase, which sometimes makes it difficult to stir a uniform slurry.

[0019]

Specific examples of the acid used for the acid treatment
10 include an inorganic acid such as hydrochloric acid, sulfuric acid, or nitric acid. The acid can be used regardless of the type, purity, and the like.

[0020]

Regarding the conditions of the acid treatment reaction,
15 from the viewpoint of stably obtaining acid-treated starch, for example, the concentration of an inorganic acid during the acid treatment is preferably 0.05 normality (N) or more and 4 N or less, more preferably 0.1 N or more and 4 N or less, and even more preferably 0.4 N or more and 3 N or less. The
20 concentration of the inorganic acid during the acid treatment is preferably 0.05 N or more, more preferably 0.1 N or more, and even more preferably 0.4 N or more. The concentration of the inorganic acid during the acid treatment is preferably 4 N or less, and more preferably 3 N or less.

25 From the same viewpoint, the reaction temperature is preferably 30°C or higher and 70°C or lower, more preferably 35°C or higher and 70°C or lower, and even more preferably 35°C

or higher and 65°C or lower. The reaction temperature is preferably 30°C or higher, and more preferably 35°C or higher. Furthermore, the reaction temperature is preferably 70°C or lower, and more preferably 65°C or lower.

5 From the same viewpoint, the reaction time is preferably 0.5 hours or longer and 120 hours or less, more preferably 1 hour or longer and 72 hours or less, and even more preferably 1 hour or longer and 48 hours or less. The reaction time is preferably 0.5 hours or longer, and more preferably 1 hour or
10 longer. Furthermore, the reaction time is preferably 120 hours or less, more preferably 72 hours or less, and even more preferably 48 hours or less.

[0021]

 The component (A) contains starch other than the low-
15 molecular-weight starch. For example, starch selected from the aforementioned starches can be used as the starch other than the low-molecular-weight starch in the component (A). The starch other than the low-molecular-weight starch in the component (A) preferably includes one starch or two or more starches selected
20 from the group consisting of maize starch, wheat starch, potato starch, tapioca starch, bean starch, and processed starch of these and more preferably includes corn starch, and is even more preferably corn starch.

[0022]

25 The component (A) is configured to satisfy the specific condition (3) in regard to a cold water swelling degree and to have a particle size satisfying the specific condition (4).

First, regarding the condition (3), from the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, a
5 cold water swelling degree of the component (A) at 25°C is 5 or more, preferably 6 or more, and even more preferably 6.5 or more.

From the same viewpoint, the cold water swelling degree of the component (A) at 25°C is 20 or less, preferably 17 or less,
10 more preferably 13 or less, and even more preferably 12 or less.

The method of measuring the cold water swelling degree of the component (A) will be described in the section of Examples.
[0023]

Next, the particle size of the component (A) will be
15 described.

Regarding the condition (4), from the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, in
20 the component (A), the content of a fraction (particles) that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm with respect to the entirety of the component (A) is 50% by mass or more, preferably 60% by mass or more, more preferably 70% by mass or more, even
25 more preferably 80% by mass or more, still more preferably 90% by mass or more, and yet more preferably 95% by mass or more.

From the same viewpoint, in the component (A), the content

of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm with respect to the entirety of the component (A) is 100% by mass or less, and preferably 99% by mass or less.

5 [0024]

From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, in the component (A), the content of a
10 fraction that passes through a sieve having a mesh size of 0.5 mm and remains on a sieve having a mesh size of 0.075 mm is preferably 20% by mass or more, more preferably 30% by mass or more, even more preferably 40% by mass or more, and still more preferably 50% by mass or more. Furthermore, the content of
15 such a fraction is, for example, 100% by mass or less, and preferably 90% by mass or less.

[0025]

From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied
20 and maintaining crispy texture in a case where the food is reheated after storage, in the component (A), the content of a fraction that passes through a sieve having a mesh size of 0.25 mm and remains on a sieve having a mesh size of 0.038 mm is preferably 10% by mass or more, more preferably 20% by mass or
25 more, even more preferably 30% by mass or more, and still more preferably 40% by mass or more. Furthermore, the content of such a fraction is, for example, 100% by mass or less.

[0026]

From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied in a case where the food is reheated after storage, the content of a fraction that remains on a sieve having a mesh size of 0.5 mm with respect to the entirety of the component (A) is 70% by mass or less, preferably 60% by mass or less, and even more preferably 55% by mass or less.

The lower limit of the content of the fraction that remains on a sieve having a mesh size of 0.5 mm is not limited, and is 0% by mass or more with respect to the entirety of the component (A). From the viewpoint of allowing the food to which the coating material for fried food is applied to have surface with preferable appearance or color after storage, the lower limit of the content of such a fraction is preferably 3% by mass or more, more preferably 5% by mass or more, even more preferably 10% by mass or more, and still more preferably 15% by mass or more.

[0027]

From the viewpoint of allowing the food to which the coating material for fried food is applied to have surface with preferable appearance or color after storage, the content of a fraction that remains on a sieve having a mesh size of 0.075 mm with respect to the entirety of the component (A) is preferably 10% by mass or more, more preferably 30% by mass or more, even more preferably 50% by mass or more, and still more preferably 70% by mass or more.

The upper limit of the content of the fraction that remains

on a sieve having a mesh size of 0.075 mm is not limited. The upper limit of the content of such a fraction is 100% by mass or less, preferably 99% by mass or less, and even more preferably 97% by mass or less.

5 [0028]

The component (A) may contain components other than starch. Specific examples of the component other than starch include a colorant and an insoluble salt such as calcium carbonate or calcium sulfate.

10 It is preferable that an insoluble salt be mixed with the component (A). The mixing amount of the insoluble salt is more preferably 0.1% by mass or more and 2% by mass or less.

[0029]

15 Next, the manufacturing method of the component (A) will be described. The manufacturing method of the component (A) includes the following steps, for example.

(Step of preparing low-molecular-weight starch) A step of performing a depolymerization treatment on starch having an amylose content of 5% by mass or more to obtain low-molecular-weight starch having a peak molecular weight of 3×10^3 or more and 5×10^4 or less.

20

(Granulation step) A step of heating and gelatinizing a raw material to granulate the raw material in which a content of low-molecular-weight starch is 3% by mass or more and 45% by mass or less and a total amount of the low-molecular-weight starch and starch other than the low-molecular-weight starch is 75% by mass or more.

25

[0030]

The step of preparing low-molecular-weight starch is a step of decomposing starch having an amylose content of 5% by mass or more to prepare low-molecular-weight starch. "Decomposing"

5 means decomposition accompanied by depolymerization of starch. Typical examples of the decomposition method include decomposition by an acid treatment, an oxidation treatment, and an enzyme treatment. Among these, from the viewpoint of decomposition rate, cost, and reproducibility of a decomposition
10 reaction, an acid treatment is preferable.

[0031]

In the granulation step, it is possible to use a general method used for granulating starch. In view of obtaining a predetermined cold water swelling degree, it is preferable to
15 use a general method used for heating and gelatinizing starch. Specifically, the methods using machines such as a drum dryer, a jet cooker, an extruder, and a spray dryer are known. In the present embodiment, from the viewpoint of more reliably obtaining the component (A) having a cold water swelling degree
20 that satisfies the specific conditions described above, heating and gelatinization by an extruder or a drum dryer is preferable, and an extruder is more preferable. In the case of extruder treatment, usually, water is added to the raw material including starch such that the water content is adjusted to about 10% to
25 60% by mass, and then the raw material is heated and gelatinized, for example, under the conditions of a barrel temperature of 30°C to 200°C, an outlet temperature of 80°C to

180°C, a screw rotation speed of 100 to 1,000 rpm, and a heat treatment time of 5 to 60 seconds.

[0032]

In the present embodiment, for example, the granulated material obtained by the step of heating and gelatinizing the specific raw material may be pulverized and sieved as necessary, such that the size of the granulated material is appropriately adjusted and the component (A) satisfying the conditions (3) and (4) is obtained.

10 [0033]

The component (A) obtained as above is powdery granular starch containing low-molecular-weight starch and is configured to satisfy the conditions (1) to (4). Therefore, mixing the component (A) with the cellulose derivative, which will be described later, and the coating material for fried food makes it possible to obtain a fried food having preferable texture even in a case where the food to which the coating material for fried food is applied is reheated after storage. Examples of the texture include the stickiness of coating and the crispiness of coating.

20

[0034]

From the viewpoint of improving the stickiness of coating of food to which the coating material for fried food is applied and maintaining crispy texture of in a case where the food is reheated after storage, the content of the component (A) in the coating material for fried food with respect to the total solid content of the coating material for fried food is preferably

25

3.0% by mass or more, more preferably 4.0% by mass or more, even more preferably 5.0% by mass or more, and still more preferably 7.0% by mass or more.

From the same viewpoint, the content of the component (A)
5 in the coating material for fried food with respect to the total solid content of the coating material for fried food is preferably 55% by mass or less, more preferably 50% by mass or less, even more preferably 40% by mass or less, and still even more preferably 30% by mass or less.

10 [0035]

(Cellulose derivative)

The cellulose derivative refers to a water-soluble polymer obtained by partially modifying cellulose.

The cellulose derivative in the present embodiment is
15 preferably cellulose ether obtained by introducing different substituents into a hydroxy group of cellulose via an ether bond. Among cellulose ethers, one cellulose ether or two or more cellulose ethers are preferable which can be used for foods and are selected from the group consisting of methyl cellulose,
20 hydroxypropyl methyl cellulose, and carboxymethyl cellulose.

In a case where methyl cellulose is to be used, it is possible to use methyl cellulose in which a methoxy group content is, for example, 25.0% or more and 33.0% or less with respect to the entirety of the methyl cellulose. In a case
25 where hydroxypropyl methyl cellulose is to be used, it is possible to use hydroxypropyl methyl cellulose in which a methoxy group content is, for example, 19.0% or more and 30.0%

or less with respect to the entirety of the hydroxypropyl methyl cellulose. In a case where carboxymethyl cellulose is to be used, it is possible to use carboxymethyl cellulose in which the content of a methoxy group is, for example, 19% or more and 33%
5 or less with respect to the entirety of the carboxymethyl cellulose.

The methoxy group content is measured according to Japan's Specifications and Standards for Food Additives (2018), 9th edition, B General Test Method, 38. Methoxy Group Quantification
10 Method (Methyl Cellulose) and D Articles of Component Specification/Storage Standard, Paragraph of Hydroxypropyl cellulose (Hydroxypropyl Cellulose). For carboxymethyl cellulose, the methoxy group content can also be measured according to the aforementioned measurement method for methyl
15 cellulose.

[0036]

From the viewpoint of improving the stickiness of coating of a food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food
20 is reheated after storage, the cellulose derivative in the present embodiment is more preferably hydroxypropyl methyl cellulose.

[0037]

From the viewpoint of improving the stickiness of coating
25 of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, the content of the cellulose derivative

with respect to the total solid content of the coating material for fried food is, for example, more than 0% by mass, preferably 0.5% by mass or more, more preferably 0.7% by mass or more, even more preferably 1.0% by mass or more, still more preferably 1.1%
5 by mass or more, and yet more preferably 1.2% by mass or more.

From the same viewpoint, the content of the cellulose derivative with respect to the total solid content of the coating material for fried food is, for example, less than 100% by mass, preferably 10.0% by mass or less, more preferably 8.0% by mass
10 or less, even more preferably 6.0% by mass or less, still more preferably 5.5% by mass or less, and yet more preferably 5.0% by mass or less.

[0038]

From the viewpoint of improving the stickiness of coating
15 of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, a mass ratio of the content of the cellulose derivative to the content of the component (A) is preferably 0.01 or more, more preferably 0.03 or more, even more
20 preferably 0.04 or more, and still more preferably 0.05 or more. From the same viewpoint, the mass ratio is preferably 3.0 or less, more preferably 2.0 or less, even more preferably 1.0 or less, still more preferably 0.8 or less, and yet more preferably 0.5 or less.

25 [0039]

(Starch)

From the viewpoint of improving the stickiness of coating

of food to which the coating material for fried food is applied and maintaining crispy texture in a case where the food is reheated after storage, it is preferable that the coating material for fried food of the present embodiment further contain one starch or two starches selected from the group consisting of oxidized starch and crosslinked starch, in addition to the component (A). The starch may be the same as or different from the low-molecular-weight starch in the component (A), but is preferably different starch.

10 [0040]

In a case where the aforementioned starch is oxidized starch, the starch may be starch that is obtained by performing only an oxidation treatment on raw material starch or starch that is obtained by performing one or more treatments other than oxidation. Specific examples of processing treatments other than oxidation include at least one treatment selected from the group consisting of esterification such as acetylation or phosphorylation; and etherification such as hydroxypropylation or carboxymethylation. In a case where the oxidized starch is obtained by processing treatments in addition to oxidation, there is no restriction on the order of the oxidation treatment and other processing treatments.

From the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the fried food is reheated after storage, the oxidized starch is preferably oxidized starch other than esterified oxidized starch, and more preferably oxidized starch other than acetylated oxidized

starch.

[0041]

Specifically, the raw material starch of the oxidized starch is one starch or two or more starches selected from the group consisting of maize starch such as high-amylose corn starch, corn starch, and waxy corn starch, tapioca starch, sweet potato starch, potato starch, wheat starch, high-amylose wheat starch, rice starch, bean starch such as mung bean starch and pea starch, and sago palm starch.

10 The raw material starch of the oxidized starch is preferably unprocessed starch.

From the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the fried food is reheated after storage, the oxidized starch is preferably one starch or two or more starches selected from the group consisting of oxidized tapioca starch and oxidized maize starch, and more preferably oxidized tapioca starch.

[0042]

In a case where the aforementioned starch is crosslinked starch, the starch may be starch that is obtained by performing only a crosslinking treatment on raw material starch or starch that is obtained by performing one or more treatments other than crosslinking and oxidation. Specific examples of treatments other than crosslinking and oxidation include at least one treatment selected from the group consisting of esterification such as acetylation or phosphorylation; and etherification such as hydroxypropylation or carboxymethylation. In a case where

the crosslinked starch is obtained by processing treatments in addition to crosslinking, there is no restriction on the order of the crosslinking treatment and other processing treatments.

Specifically, the crosslinked starch is one starch or two
5 or more starches selected from the group consisting of
phosphoric acid crosslinked starch and derivatives thereof such
as phosphoric acid crosslinked starch, acetylated phosphoric
acid crosslinked starch, monophosphorylated phosphoric acid
crosslinked starch, and hydroxypropylated phosphoric acid
10 crosslinked starch; and adipic acid crosslinked starch and
derivatives thereof such as adipic acid crosslinked starch and
acetylated adipic acid crosslinked starch.

[0043]

Specifically, the raw material starch of the crosslinked
15 starch is one starch or two or more starches selected from the
group consisting of maize starch such as high-amylose corn
starch, corn starch, and waxy corn starch, tapioca starch, sweet
potato starch, potato starch, wheat starch, high-amylose wheat
starch, rice starch, bean starch such as mung bean starch and
20 pea starch, and sago palm starch.

The raw material starch of the crosslinked starch is
preferably unprocessed starch.

[0044]

From the viewpoint of improving the stickiness of coating
25 and maintaining crispy texture in a case where the fried food is
reheated after storage, the crosslinked starch is preferably
starch that is obtained by performing only a crosslinking

treatment on raw material starch, more preferably phosphoric acid crosslinked starch, and even more preferably phosphoric acid crosslinked tapioca starch.

[0045]

5 From the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the fried food is reheated after storage, the content of starch in the coating material for fried food with respect to the total solid content of the coating material for fried food is, for example, more
10 than 0% by mass, preferably 5% by mass or more, more preferably 8% by mass or more, even more preferably 12% by mass or more, still more preferably 15% by mass or more, yet more preferably 17% by mass or more, even more so preferably 20% by mass or more, and most preferably 23% by mass or more.

15 From the same viewpoint, the content of starch in the coating material for fried food with respect to the total solid content of the coating material for fried food is, for example, less than 100% by mass, preferably 99.5% by mass or less, more preferably 90% by mass or less, even more preferably 65% by mass
20 or less, still more preferably 60% by mass or less, yet more preferably 55% by mass or less, even more so preferably 50% by mass or less, and most preferably 45% by mass or less.

The content of starch refers to the total amount of oxidized starch and crosslinked starch.

25 [0046]

From the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the fried food is

reheated after storage, a mass ratio of the content of starch to the content of the component (A) (starch/component (A)) in the coating material for fried food is preferably 0.5 or more, more preferably 0.6 or more, even more preferably 0.7 or more, still
5 more preferably 0.8 or more, and yet more preferably 0.9 or more.

From the same viewpoint, the mass ratio (starch/component (A)) is preferably 9 or less, more preferably 8 or less, even more preferably 7 or less, still more preferably 6 or less, yet
10 more preferably 5 or less, and even more so preferably 4 or less.

[0047]

From the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the fried food is
15 reheated after storage, a mass ratio of the content of starch to the total content of the component (A) and the cellulose derivative (starch/(component (A) + cellulose derivative)) in the coating material for fried food is preferably 0.5 or more, more preferably 0.6 or more, even more preferably 0.7 or more,
20 still more preferably 0.8 or more, yet more preferably 0.9 or more, and even more so preferably 0.95 or more.

From the same viewpoint, the mass ratio (starch/(component (A) + cellulose derivative)) is preferably 9 or less, more preferably 7 or less, even more preferably 6 or less, still more
25 preferably 5 or less, yet more preferably 4 or less, even more so preferably 3 or less, and most preferably 2 or less.

[0048]

(Other components)

The coating material for fried food may further contain components other than the component (A), the cellulose derivative, and starch. Examples of other components include starch other than the component (A) and the aforementioned starch, such as unprocessed starch (raw starch) or processed starch; cereal flour such as wheat flour including cake flour or rice flour; dried egg such as whole egg powder; a leavening agent such as baking powder; a coating material other than the aforementioned coating material for fried food, such as bread crumbs; a protein such as gluten; seasonings; food colorings; an emulsifier, and the like.

[0049]

From the viewpoint of improving the stickiness of coating in a case where the fried food is reheated after storage, the coating material for fried food preferably further contains cereal flour, more preferably further contains wheat flour, and even more preferably further contains cake flour.

In a case where the coating material for fried food further contains cereal flour, from the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the fried food is reheated after storage, the content of the cereal flour with respect to the total solid content of the coating material for fried food is preferably 5% by mass or more, more preferably 8% by mass or more, and even more preferably 10% by mass or more.

Furthermore, from the viewpoint of allowing the surface of

the fried food to have preferable appearance in a case where the fried food is reheated after storage, the content of the cereal flour with respect to the total solid content of the coating material for fried food is preferably 59% by mass or less, more preferably 50% by mass or less, even more preferably 40% by mass or less, and still more preferably 30% by mass or less.

[0050]

In a case where the coating material for fried food contains cereal flour, from the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the fried food is reheated after storage, a mass ratio of the content of the cereal flour to the total content of the component (A) and the cellulose derivative (cereal flour/(component (A) + cellulose derivative)) in the coating material for fried food is preferably 0.4 or more, more preferably 0.5 or more, even more preferably 0.6 or more, and still more preferably 0.7 or more.

From the same viewpoint, the mass ratio of the content of the cereal flour to the total content of the component (A) and the cellulose derivative (cereal flour/((A) + cellulose derivative)) in the coating material for fried food is preferably is 8 or less, more preferably 5 or less, even more preferably 4 or less, still more preferably 3.5 or less, yet more preferably 3 or less, and even more so preferably 2.5 or less.

[0051]

The coating material for fried food of the present

embodiment may be used as it is or used in combination with other components.

In addition, the properties of the coating material for fried food may be powdery or liquid.

5 In a case where the coating material for fried food is used for a batter, only the coating material for fried food may be dispersed in water to prepare a liquid batter, or other components may be added to prepare a liquid batter.

[0052]

10 (Batter)

In the present embodiment, a batter contains the coating material for fried food of the present embodiment described above.

[0053]

15 The batter further contains water. The remainder that is left when the content of components other than water contained in the batter is subtracted from the total amount of the batter can be determined as water content in the batter.

[0054]

20 From the viewpoint of obtaining excellent handleability, the content of the coating material for fried food in the entirety of the batter is preferably 15% by mass or more, more preferably 20% by mass or more, even more preferably 24% by mass or more, and still more preferably 26% by mass or more. From
25 the same viewpoint, the content of the coating material for fried food is preferably 50% by mass or less, more preferably 40% by mass or less, even more preferably 38% by mass or less,

and still more preferably 35% by mass or less.

The entirety of the batter refers to the total amount of the batter including water.

[0055]

5 (Breeder)

In the present embodiment, a breeder contains the coating material for fried food of the present embodiment described above.

[0056]

10 From the viewpoint of obtaining excellent handleability, the content of the coating material for fried food in the entirety of the breeder is preferably 50% by mass or more, more preferably 60% by mass or more, even more preferably 70% by mass or more, and still more preferably 80% by mass or more. The
15 upper limit of the content of the coating material for fried food in the entirety of the breeder is not limited. From the same viewpoint as above, the content of the coating material for fried food is, for example, 100% by mass or less, and preferably 100% by mass.

20 [0057]

The breeder may further contain components other than the coating material for fried food. As other components, for example, cereal flour such as wheat flour including cake flour or rice flour; a leavening agent such as baking powder; a
25 coating material other than the aforementioned coating material for fried food, such as bread crumbs; seasonings; food colorings; an emulsifier, and the like are preferable.

[0058]

(Fried food)

The fried food in the present embodiment contains the coating material of the present embodiment described above.

5 [0059]

Specific examples of the fried food of the present embodiment include deep-fried foods such as Karaage, Tatsutaage, fried chicken, and chicken nuggets; cutlets such as pork cutlet, minced meat cutlet, and chicken cutlet; croquettes such as cream
10 croquette, potato croquette, and pumpkin croquette; fried dishes such as fried fish, fried shrimp, fried oyster, and fried squid; and fried breads such as curry breads and doughnuts.

As the fried food of the present embodiment, from the viewpoint of suppressing the stickiness of coating and obtaining
15 excellent texture in a case where the fried food is reheated after storage, it is preferable to use one fried food selected from the group consisting of deep-fried foods, cutlets, croquettes, and fried dishes.

[0060]

20 The stuffing of fried food in the present embodiment is not limited, and it is possible to use stuffing that is generally used in fried foods. Examples of the stuffing include meats such as chicken, pork, and beef; processed meat products and meat-like processed products; seafood such as shrimp, squid,
25 oyster, scallop, horse mackerel, and cod; processed marine products such as sea food paste products; fresh produce such as vegetables; breads such as curry bread; sauces such as white

sauce in cream croquettes and curry in curry breads; crushed vegetables in potato croquettes and pumpkin croquettes; and cheeses. In addition, the stuffing of the fried food in the present embodiment can include both the solid ingredients

5 prepared by cutting meat, seafood, vegetables, fruits, pastas, and the like into small pieces and solid ingredients such as corn and green peas that are originally in the form of small pieces.

[0061]

10 (Manufacturing method of fried food)

The manufacturing method of fried food includes a step of coating the outside of a stuffing with the aforementioned batter and a step of heating and cooking the batter-coated stuffing to obtain food.

15 Furthermore, the manufacturing method of fried food includes a step of coating the outside of a stuffing with the aforementioned breader and a step of heating and cooking the breader-coated stuffing to obtain food.

In addition, the manufacturing method of fried food further
20 includes, after the step of coating the outside of a stuffing with the aforementioned batter, a step of further coating the outside of the stuffing with the aforementioned breader and a step of then heating and cooking the batter and breader-coated stuffing to obtain food.

25 [0062]

In the manufacturing method of fried food of the present embodiment, the coating material for fried food can be used as

at least either a batter or a breader. It is preferable that the coating material for fried food be used as both the batter and breader.

[0063]

5 In the present embodiment, in a case where both the step of coating the outside of a stuffing with a batter and a step of coating the outside of a stuffing with a breader are performed, either of these steps may be performed first. From the viewpoint of improving the stickiness of coating and maintaining
10 crispy texture in a case where the obtained fried food is reheated after storage, it is preferable that the step of coating with a breader be performed after the step of coating with a batter.

 The step of coating with a batter may be performed multiple
15 times, such as a first battering step and a second battering step. Furthermore, the step of coating with a breader may be performed multiple times, such as a first breader step and a second breader step. The order of steps may be, for example, a first battering step, a breader step, and a second battering
20 step.

[0064]

 The manufacturing method of fried food in the present embodiment may include the following steps in addition to the steps described above.

25 (Dusting powder coating step): A step of coating the outside of a stuffing with dusting powder

 (Step of forming outermost coating material layer): A step

of coating the batter-coated stuffing, the breader-coated stuffing, or the batter and breader-coated stuffing with bread crumbs as an outermost coating material layer.

[0065]

5 From the viewpoint of improving the stickiness of coating and maintaining crispy texture in a case where the obtained fried food is reheated after storage, specifically, the form of cooking in the step of heating and cooking to obtain food is preferably deep frying in cooking oil, for example. The
10 temperature of the deep frying is preferably, for example, about 100°C to 200°C.

[0066]

The manufacturing method of food may further include a step of freezing the food for preservation, after the step of
15 obtaining food. The freezing temperature for preservation can be, for example, about -10°C to -50°C.

[0067]

The manufacturing method of food may further include a step of thawing the food by heating, after the step of freezing the
20 food for preservation. In the step of thawing by heating, from the viewpoint of obtaining excellent texture, it is preferable to use a microwave oven or a steam convection oven to thaw the food by heating.

[0068]

25 (Method of improving texture of fried food)

The method of improving texture of fried food of the present embodiment includes a step of incorporating a component

(A) and a cellulose derivative into a coating material for fried food. The component (A) is a powdery granular material that satisfies the following conditions (1) to (4). The description of details of the conditions (1) to (4) will not be repeated
5 because they are the same as those described above in the section of (Coating material for fried food).

(1) A starch content in the powdery granular material is 75% by mass or more.

(2) A content of a low-molecular-weight starch obtained
10 from a starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery granular material, and a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more and 5×10^4 or less.

(3) A cold water swelling degree of the powdery granular
15 material at 25°C is 5 or more and 20 or less.

(4) A content of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.

20 [0069]

With the method of improving texture of fried food of the present embodiment, the stickiness of coating of the fried food is suppressed, and a crispy fried food is obtained.

[0070]

25 (Method of improving texture in a case where fried food is reheated)

The method of improving texture in a case where the fried

food of the present embodiment is reheated includes a step of incorporating a component (A) and a cellulose derivative into a coating material for fried food. The component (A) is a powdery granular material that satisfies the following conditions (1) to 5 (4). The description of details of the conditions (1) to (4) will not be repeated because they are the same as those described above in the section of (Coating material for fried food).

(1) A starch content in the powdery granular material is 10 75% by mass or more.

(2) A content of a low-molecular-weight starch obtained from a starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery granular material, and a peak molecular weight of the low- 15 molecular-weight starch is 3×10^3 or more and 5×10^4 or less.

(3) A cold water swelling degree of the powdery granular material at 25°C is 5 or more and 20 or less.

(4) A content of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a 20 mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.

[0071]

With the method of improving texture in a case where the fried food of the present embodiment is reheated, the stickiness 25 of coating of the fried food is suppressed, and a crispy fried food is obtained, even in a case where the fried food is reheated after storage.

Examples

[0072]

Examples of the present invention will be shown below, but the gist of the present invention is not limited thereto.

5 In the following examples, unless otherwise specified, "%" means "% by mass". In addition, unless otherwise specified, "parts" means "parts by mass".

[0073]

(Raw materials)

10 The following materials were mainly used as raw materials.
Cake flour: "Special flour", manufactured by UNITED FLOUR
MILL PUBLIC CO., LTD.

Corn starch: "Corn Starch", manufactured by Friendship Corn
Starch Co., Ltd.

15 Powdery granular material 1: Powdery granular material 1
manufactured in Manufacture Example 2 that will be described
later

Powdery granular material 2: Powdery granular material 2
manufactured in Manufacture Example 2 that will be described
20 later

Powdery granular material 3: Powdery granular material 3
manufactured in Manufacture Example 2 that will be described
later

Tapioca starch: Manufactured by Siam Starch (1966) Co.,
25 Ltd.

Oxidized starch: Oxidized starch manufactured in
Manufacture Example 3 that will be described later

Phosphoric acid crosslinked tapioca starch: "ACTBODY TP-2",
manufactured by J-OIL MILLS, INC.

Hydroxypropyl methyl cellulose: "VIVAPUR Hydroxypropyl
Methyl Cellulose", manufactured by Derivados Macroquimicos S. A.
5 de C. V. methoxy group content: 28 to 30%

Carboxymethyl cellulose: "Sodium carboxymethyl cellulose
(CMC) (Type FVH9-2)", manufactured by CHONGQING LIHONG FINE
CHEMICALS CO., LTD.

Methyl cellulose: "Methocel A4M", manufactured by DDP
10 SPECIALTY PRODUCT GERMANY GMBH & CO. KG

Baking powder: "Baking Powder Double Acting Formula",
manufactured by UNILEVER THAI HOLDINGS LIMITED

Gluten: "Wheat Gluten", manufactured by MANILDRA STARCHES
PTY CO., LTD.

15 Paprika powder: "Paprika", manufactured by TONE BROTHERS,
INC.

Garlic powder: "Ground Garlic", manufactured by ARTCHIT
INTERNATIONAL PEPPER AND SPICE CO., LTD.

Refined sugar: "Sugar", manufactured by THAI ROONG RUANG
20 SUGAR GROUP CO., LTD.

Sodium glutamate: "MSG", manufactured by AJINOMOTO CO.,
(THAILAND) LTD.

Salt: "Iodized Refined Salt", manufactured by THAI REFINED
SALT CO., LTD.

25 Bread crumbs: "Breadcrumbs", manufactured by R & B FOOD
SUPPLY PUBLIC COMPANY LIMITED

[0074]

(Manufacture Example 1) Manufacturing of low-molecular-weight starch

Acid-treated high-amylose corn starch was manufactured as low-molecular-weight starch that was a raw material of powdery granular materials 1 to 3.

The high-amylose corn starch (manufactured by J-OIL MILLS, INC., HS-7, amylose content 70% by mass) was suspended in water to prepare a 35.6% (w/w) slurry, and the slurry was heated to 50°C. While the slurry was being stirred, a 4.25 N aqueous hydrochloric acid solution was added thereto at a mass ratio of 1/9 (HCl solution/slurry) such that a reaction was initiated. After the reaction for 16 hours, the reaction mixture was neutralized with 3% NaOH, rinsed with water, dehydrated, and dried, thereby obtaining acid-treated high-amylose corn starch.

The peak molecular weight of the obtained acid-treated high-amylose corn starch was measured by the method that will be described later. The peak molecular weight was 1.2×10^4 .

[0075]

(Method of measuring peak molecular weight)

The peak molecular weight was measured using an HPLC unit manufactured by TOSOH CORPORATION (Pump DP-8020, RI detector RS-8021, deaerator SD-8022).

(1) The sample was pulverized and put through sieves meeting the JIS-Z8801-1 standard, and a fraction passing through a sieve having a mesh size of 0.15 mm was collected. The collected fraction was suspended in the mobile phase at 1 mg/mL, and the suspension was heated at 100°C for 3 minutes such that

the fraction completely dissolved. The suspension was filtered through a 0.45 μm filter (manufactured by ADVANTEC Group, DISMIC-25HP PTFE 0.45 μm), and the filtrate was used as an analysis sample.

- 5 (2) The molecular weight was measured under the following analytical conditions.

Column: TSKgel α -M (7.8 mm ϕ , 30 cm) (manufactured by TOSOH CORPORATION), 2 pieces

Flow rate: 0.5 mL/min

- 10 Mobile phase: 5 mM sodium nitrate-containing 90% (v/v) dimethyl sulfoxide solution

Column temperature: 40°C

Analysis amount: 0.2 mL

- 15 (3) The detector data was collected by software (multi-station GPC-8020 model II data collection ver 5.70, manufactured by TOSOH CORPORATION), and the molecular weight peak was calculated.

- 20 Pullulan (Shodex Standard P-82, manufactured by SHOWA DENKO K.K.) with a known molecular weight was used for the calibration curve.

[0076]

(Method of measuring cold water swelling degree)

- 25 (1) A sample was heated and dried at 125°C by using a moisture meter (manufactured by Kensei Kogyo Co., Ltd., model number MX-50) to measure the moisture content, and the mass of the dried substance was calculated from the obtained moisture content.

(2) The sample in an amount of 1 g equivalent to the mass of the dried substance was dispersed in 50 mL of water at 25°C, the dispersion was gently stirred in a thermostatic bath at 25°C for 30 minutes, and then the dispersion was centrifuged for 10
5 minutes at 3,000 rpm (centrifuge: manufactured by Hitachi Koki Co., Ltd., Hitachi tabletop centrifuge CT6E; rotor: T4SS swing rotor; adapter: 50TC × 2S adapter) such that the dispersion was separated into a sediment layer and a supernatant layer.

(3) The supernatant layer was removed, and the mass of the
10 sediment layer was measured and designated as B (g).

(4) The mass obtained when the sediment layer was dried and solidified (105°C, constant quantity) was designated as C (g).

(5) The value obtained by dividing B by C was defined as a cold water swelling degree.

15 [0077]

(Manufacture Example 2) Manufacturing of powdery granular materials 1 to 3

Corn starch (CORN STARCH Y, manufactured by J-OIL MILLS, INC., 79% by mass), 20% by mass of the acid-treated high-amylose
20 corn starch obtained in Manufacture Example 1, and 1% by mass of calcium carbonate were mixed together in a bag until the mixture became thoroughly homogeneous. The mixture was treated by pressing and heating with a twin screw extruder (KEI-45, manufactured by KOWA KOGYO Inc.). The treatment conditions are
25 as follows.

Supply of raw material: 450 g/min (heat treatment time: about 10 seconds)

Addition of water: water was added such that the water amount was 17% by mass with respect to the entire raw materials.

Barrel temperature: 50°C, 70°C, and 100°C to the outlet from the raw material inlet

5 Outlet temperature: 100°C to 110°C

Rotation speed of screw: 250 rpm

The heated and gelatinized substance obtained as above by the extruder treatment was dried at 110°C such that the water content was adjusted to 10% by mass.

10 Next, the heated and gelatinized substance that was dried was pulverized with a tabletop cutter pulverizer, and then sieved with sieves meeting the JIS-Z8801-1 standard. The heated and gelatinized substances that were sieved were mixed together at a predetermined mixing ratio, thereby preparing the powdery
15 granular materials 1 to 3 having the particle size distribution shown in Table 1. The cold water swelling degrees of the powdery granular materials 1 to 3 measured at 25°C by the above method are shown in Table 1.

[0078]

[Table 1]

		Powdery granular material 1	Powdery granular material 2	Powdery granular material 3
Fraction (% by mass)	Passing through 3.35 mm sieve and remaining on 1.4 mm sieve			0.2
	Passing through 1.4 mm sieve and remaining on 1 mm sieve			13.2
	Passing through 1 mm sieve and remaining on 0.5 mm sieve		18.0	38.5
	Passing through 0.5 mm sieve and remaining on 0.25 mm sieve		42.0	19.5
	Passing through 0.25 mm sieve and remaining on 0.15 mm sieve	36.4	15.0	10.4
	Passing through 0.15 mm sieve and remaining on 0.075 mm sieve	48.0	20.0	13.7
	Passing through 0.075 mm sieve and remaining on 0.038 mm sieve	11.4	3.7	3.3
	Passing through 0.038 mm sieve	4.2	1.3	1.2
	Total	100.0	100.0	100.0
	Passing through 3.35 mm sieve and remaining on 0.038 mm sieve	95.8	98.7	98.8
	Passing through 0.5 mm sieve and remaining on 0.075 mm sieve	84.4	77.0	43.6
	Passing through 0.25 mm sieve and remaining on 0.038 mm sieve	95.8	38.7	27.4
	Cold water swelling degree	7.3	10.5	10.0

[0079]

(Manufacture Example 3) Manufacturing of oxidized starch

5 Tapioca starch (150 g) and 190 g of distilled water were added to and dispersed in a separable flask, thereby preparing a slurry having a concentration of 38.2% by mass equivalent to the mass of dry matters.

The temperature of the obtained slurry was adjusted to
 10 37°C, and 18.2 mL of an aqueous sodium hypochlorite solution (effective chlorine concentration: 14.3%) was then added thereto at a time such that the effective chlorine concentration was adjusted to 2% by mass/g.

After the addition of the aqueous sodium hypochlorite
 15 solution, a 3% by mass aqueous sodium hydroxide solution was added dropwise thereto to adjust the pH to 9.9.

Thereafter, the sodium hydroxide solution was added

dropwise at the proper time such that the pH was kept in a range of set pH $\pm$ 0.03 until the end of the reaction, thereby obtaining oxidized starch.

The point in time when a small amount of the slurry sampled
5 added dropwise to a saturated potassium iodide solution did not turn purple was regarded as the end of the reaction.

After the confirmation of the end of the reaction, 3% by mass hydrochloric acid was added to the slurry such that the slurry was neutralized to pH 6, and then the oxidized starch in
10 the slurry was washed and dehydrated.

Then, the resultant was dried at 40°C overnight, pulverized, and sieved with a 60-mesh sieve (mesh size: 250 μ m), and the obtained resultant was used as oxidized starch of the present example.

15 [0080]

(Examples 1 to 16 and Comparative Examples 1 to 3)

In the present examples, fried chicken was prepared and evaluated.

(Manufacturing method of fried chicken)

20 1. Chicken with bones (about 50 g for each piece) was coated with dusting powder (cake flour).

2. Ingredients were mixed together according to the formulation shown in each table, thereby preparing a batter of each example.

25 3. The chicken with bones coated with the dusting powder in 1. was coated with the batter obtained in 2. The amount of the batter was about 10 g/piece for the chicken.

4. Ingredients were mixed together according to the formulation of each table, thereby preparing a breeder of each example.

5. The chicken with bones coated with the batter in 3. was coated with the breeder obtained in 4. The amount of the breeder was about 5 g/piece for the chicken.

6. The chicken with bones coated with the breeder in 5. was deep-fried in palm oil ("refined palm olein oil", manufactured by Sime darby oils morakot public company limited) at a temperature of 170 to 180°C for 11 minutes.

7. The chicken with bones deep-fried in 6. was arranged on a pad, cooled to room temperature, then put in a plastic container, and stored at -10°C for 1 day.

8. The chicken with bones after storage in 7. was heated in a microwave oven (800 W, 2 minutes).

9. The chicken with bones heated in the microwave oven in 8. was left to stand at room temperature for 5 minutes.

10. The texture of the fried chicken obtained by the above procedure was evaluated. The evaluation items and scoring criteria will be shown below.

[0081]

(Texture Evaluation)

Five expert panelists conducted sensory evaluations on the stickiness of coating and crispiness of the fried chicken based on the following scoring criteria, and the average score was adopted as the evaluation score. The samples scored 3.0 or more were considered as acceptable. The results are shown in Tables

2 to 5.

(Stickiness of coating)

1 point: Very sticky

2 points: Sticky (time taken for swallowing the sample is
5 longer than the time taken for swallowing the sample scored 3
points)

3 points: Slightly sticky (time taken for swallowing the
sample is shorter than the time taken for swallowing the sample
scored 2 points)

10 4 points: Substantially not sticky (the sample is not
sticky at all at first, but feels sticky when chewed)

5 points: Not sticky at all

(Crispiness)

1 Point: Not crispy at all

15 2 Points: Substantially not crispy

3 Points: Slightly crispy

4 Points: Crispy (the coating is easily crushed when
chewed)

5 Points: Very crispy (the coating is very easily crushed
20 when chewed)

[0082]

(Evaluation with texture analyzer)

In Examples 11 to 13, the physical properties of the fried
chicken obtained in (Manufacturing method of fried chicken) were
25 evaluated with a texture analyzer as follows.

Specifically, a plunger was brought into contact with the
center of the fried chicken, and the fried chicken was

compressed by 15 mm. At this time, the maximum strength (g) (breaking strength (g)) applied when the sample was broken and the peak count (g) were measured. For each example, the average of values measured for 6 samples was adopted as the measured value. The results are shown in Table 4.

The larger the value of the breaking strength (g), the harder the coating of the fried chicken. The larger the value of the peak count (g), the more the coating is crispy. The device and measurement conditions used in the test are as below.

10 Texture analyzer

Device: TA-XT Plus (manufactured by Stable Micro Systems)

Plunger: Cylinder with a diameter of 5 mm

Test speed: 2 mm/s

Trigger force: 5 g

15 Compression condition: 15 mm compression

[0083]

[Table 2]

		Unit	Comparative Example 1	Comparative Example 2	Comparative Example 3	Example 1	Example 2	Example 3
Formulation	Cake flour	Parts by mass	33.98	78.96	33.98	76.05	33.98	33.98
	Corn starch		66.02					
	(A) powdery granular material 2			21.04		21.04	21.04	21.04
	Oxidized starch				33.01		21.04	21.04
	Phosphoric acid crosslinked tapioca starch				33.01		21.03	21.03
	Hydroxypropyl methyl cellulose					2.91	2.91	2.91
	Baking powder		1.00	1.00	1.00	1.00	1.00	1.00
	Gluten		3.00	3.00	3.00	3.00	3.00	3.00
	Paprika powder		1.00	1.00	1.00	1.00	1.00	1.00
	Garlic powder		3.00	3.00	3.00	3.00	3.00	3.00
	Refined sugar		3.00	3.00	3.00	3.00	3.00	3.00
	Sodium glutamate		3.00	3.00	3.00	3.00	3.00	3.00
	Salt		4.00	4.00	4.00	4.00	4.00	4.00
	Bread crumbs		15.00	15.00	15.00	15.00	15.00	15.00
	Water		149.63	342.00	149.63	342.00	342.00	
	Total		282.63	475.00	282.63	475.00	475.00	133.00
Dusting powder			Cake flour	Cake flour	Cake flour	Cake flour	Cake flour	Cake flour
Batter			Using the above formulation	Using the above formulation	Using the above formulation	Using the above formulation	Using the above formulation	Using Comparative Example 1
Breader			Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using Comparative Example 1	Using the above formulation (excluding water)
Component (A)/coating material		% by mass	-	15.82	-	15.82	15.82	15.82
Cellulose derivative/coating material		% by mass	-	-	-	2.19	2.19	2.19
Cellulose derivative/component (A)		Mass ratio	-	-	-	0.14	0.14	0.14
Starch/(component (A) + cellulose derivative)		Mass ratio	-	-	-	0	1.76	1.76
Texture evaluation	Stickiness of coating		1.0	2.3	2.0	4.3	3.0	4.0
	Crispiness		1.0	2.7	2.0	4.0	4.0	4.0

[0084]

As is evident from Table 2, using the batter and breader of the present embodiment in combination made it possible to obtain fried chicken with excellent texture that was improved in terms

of the stickiness of coating (Example 1). In addition, using either the batter or breader of the present embodiment that further contains starch made it possible to obtain fried chicken with excellent texture that was improved in terms of the

5 stickiness of coating (Examples 2 and 3).

[0085]

[Table 3]

		Unit	Example 4	Example 5	Example 6	Example 7	Example 8	Example 9	Example 10
Formulation	Cake flour	Parts by mass	33.98	33.98	33.98	33.98	33.98	33.98	33.98
	(A) powdery granular material 1				21.04				
	(A) powdery granular material 2		21.04			11.04	31.04	41.04	21.04
	(A) powdery granular material 3			21.04					
	Oxidized starch		21.04	21.04	21.04	21.04	21.04	21.04	31.04
	Phosphoric acid crosslinked tapioca starch		21.03	21.03	21.03	21.03	21.03	21.03	31.04
	Hydroxypropyl methyl cellulose		2.91	2.91	2.91	2.91	2.91	2.91	2.91
	Baking powder		1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Gluten		3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Paprika powder		1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Garlic powder		3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Refined sugar		3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Sodium glutamate		3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Salt		4.00	4.00	4.00	4.00	4.00	4.00	4.00
	Bread crumbs		15.00	15.00	15.00	15.00	15.00	15.00	15.00
	Water		342.00	342.00	342.00	342.00	342.00	342.00	342.00
	Total		475.00	475.00	475.00	465.00	485.00	495.00	495.01
Dusting powder			Cake flour	Cake flour	Cake flour	Cake flour	Cake flour	Cake flour	Cake flour
Batter			Using the above formulation	Using the above formulation	Using the above formulation	Using the above formulation	Using the above formulation	Using the above formulation	Using the above formulation
Breeder			Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)
Component (A)/coating material		% by mass	15.82	15.82	15.82	8.98	21.71	26.82	13.75
Cellulose derivative/coating material		% by mass	2.19	2.19	2.19	2.37	2.03	1.90	1.90
Cellulose derivative/component (A)		Mass ratio	0.14	0.14	0.14	0.26	0.09	0.07	0.14
Starch/(component (A) + cellulose derivative)		Mass ratio	1.76	1.76	1.76	3.02	1.24	0.96	2.59
Texture evaluation	Stickiness of coating		5.0	4.0	4.7	3.0	4.0	4.7	3.0
	Crispiness		5.0	4.7	4.7	4.0	4.7	5.0	4.0

[0086]

As is evident from Table 3, using the batter and breeder of 5 examples made it possible to obtain fried chicken with excellent

texture that was improved in terms of the stickiness of coating.

Specifically, in a case where any of the powdery granular materials 1 to 3 having different particle sizes was used as the component (A), it was possible to obtain fried chicken with
5 excellent texture that was improved in terms of the stickiness of coating (Examples 4 to 6).

In a case where the fried chicken was prepared using the batter and the breader in combination that contained the coating material for fried food in which the content of the component
10 (A) was in a range of 8.98% by mass to 26.82% by mass, it was possible to obtain fried chicken with excellent texture that was improved in terms of the stickiness of coating in all examples (Examples 4 and 7 to 9).

Furthermore, in a case where the fried chicken was prepared
15 using the batter and the breader in combination that contained the coating material for fried food in which the content of oxidized starch was in a range of 13.75% by mass to 20.29% by mass and the content of phosphoric acid crosslinked tapioca starch was in a range of 13.75% by mass to 20.29% by mass, it
20 was possible to obtain fried chicken with excellent texture that was improved in terms of the stickiness of coating in all cases (Examples 9 and 10).

[0087]

[Table 4]

		Unit	Example 11	Example 12	Example 13
Formulation	Cake flour	Parts by mass	33.98	33.98	33.98
	(A) powdery granular material 2		31.86	31.86	31.86
	Oxidized starch		31.86	31.86	31.86
	Phosphoric acid crosslinked tapioca starch		31.86	31.86	31.86
	Hydroxypropyl methyl cellulose		2.00	4.00	6.00
	Baking powder		1.00	1.00	1.00
	Gluten		3.00	3.00	3.00
	Paprika powder		1.00	1.00	1.00
	Garlic powder		3.00	3.00	3.00
	Refined sugar		3.00	3.00	3.00
	Sodium glutamate		3.00	3.00	3.00
	Salt		4.00	4.00	4.00
	Bread crumbs		15.00	15.00	15.00
	Water		342.00	342.00	342.00
	Total		506.56	508.56	510.56
Dusting powder			Cake flour	Cake flour	Cake flour
Batter			Using the above formulation	Using the above formulation	Using the above formulation
Breader			Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)
Component (A)/coating material		% by mass	19.36	19.13	18.90
Cellulose derivative/coating material		% by mass	1.22	2.40	3.56
Cellulose derivative/component (A)		Mass ratio	0.06	0.13	0.19
Starch/(component (A) + cellulose derivative)		Mass ratio	1.88	1.78	1.68
Evaluation with texture analyzer	Breaking strength	g	449.1	480.3	493.9
	Peak count	g	12.8	20.2	20.8
Texture evaluation	Stickiness of coating		3.0	5.0	5.0
	Crispiness		4.0	5.0	5.0

[0088]

As is evident from Table 4, using the batter and breeder of 5 examples made it possible to obtain fried chicken with excellent texture that was improved in terms of the stickiness of coating.

Specifically, in a case where the fried chicken was prepared using the batter and the breeder in combination that contained the coating material for fried food in which the

content of hydroxypropyl methyl cellulose was in a range of 1.22% by mass to 3.56% by mass, it was possible to obtain fried chicken with excellent texture that was improved in terms of the stickiness of coating in all examples (Examples 11 to 13).

- 5 The fried chicken in Examples 12 and 13 was more pleasantly crispy. Furthermore, in these examples, more peak counts were obtained in the texture analyzer evaluation.

[0089]

[Table 5]

		Unit	Example 14	Example 15	Example 16
Formulation	Cake flour	Parts by mass	33.98	33.98	33.98
	(A) powdery granular material 2		31.86	31.86	31.86
	Oxidized starch		31.86	31.86	31.86
	Phosphoric acid crosslinked tapioca starch		31.86	31.86	31.86
	Baking powder		1.00	1.00	1.00
	Gluten		3.00	3.00	3.00
	Paprika powder		1.00	1.00	1.00
	Garlic powder		3.00	3.00	3.00
	Refined sugar		3.00	3.00	3.00
	Sodium glutamate		3.00	3.00	3.00
	Salt		4.00	4.00	4.00
	Bread crumbs		15.00	15.00	15.00
	Hydroxypropyl methyl cellulose		4.42		
	Carboxymethyl cellulose			4.42	
	Methyl cellulose				4.42
	Water		342.00	342.00	342.00
	Total		508.98	508.98	508.98
Dusting powder			Cake flour	Cake flour	Cake flour
Batter			Using the above formulation	Using the above formulation	Using the above formulation
Breeder			Using the above formulation (excluding water)	Using the above formulation (excluding water)	Using the above formulation (excluding water)
Texture evaluation	Stickiness of coating		5.0	3.0	4.0
	Crispiness		5.0	4.0	5.0

[0090]

As is evident from Table 5, using the batter and breeder of 5 examples made it possible to obtain fried chicken with excellent texture that was improved in terms of the stickiness of coating.

Specifically, in a case where the fried chicken was prepared using the batter and the breeder in combination that used any of hydroxypropyl methyl cellulose, carboxymethyl 10 cellulose, and methyl cellulose as a cellulose derivative, it was possible to obtain fried chicken with excellent texture that was improved in terms of the stickiness of coating in all

examples (Examples 14 to 16).

[0091]

This application claims a priority based on Japanese Patent
Application No. 2021-113287 filed on July 8, 2021, the entire
5 content of which is incorporated into the present specification.

CLAIMS

[Claim 1] A coating material for fried food, comprising:

the following component (A); and

5 a cellulose derivative,

wherein the coating material is for a batter or breader,

component (A): a powdery granular material satisfying the following conditions (1) to (4),

(1) a starch content in the powdery granular material is
10 75% by mass or more,

(2) a content of a low-molecular-weight starch obtained from a starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery granular material, and a peak molecular weight of the low-
15 molecular-weight starch is 3×10^3 or more and 5×10^4 or less,

(3) a cold water swelling degree of the powdery granular material at 25°C is 5 or more and 20 or less,

(4) a content of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a
20 mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.

[Claim 2] The coating material for fried food according to claim 1,

25 wherein the cellulose derivative is one compound or two or more compounds selected from the group consisting of methyl

cellulose, hydroxypropyl methyl cellulose, and carboxymethyl cellulose.

[Claim 3] The coating material for fried food according to
5 claim 1 or 2,
wherein the cellulose derivative is hydroxypropyl methyl cellulose.

[Claim 4] The coating material for fried food according to
10 claim 1 or 2,
wherein a content of the cellulose derivative in the coating material is 0.5% by mass or more and 10.0% by mass or less with respect to a total solid content of the coating material.

15

[Claim 5] The coating material for fried food according to claim 1 or 2,
wherein a mass ratio of a content of the cellulose derivative in the coating material to a content of the component
20 (A) in the coating material is 0.01 or more and 3.0 or less.

[Claim 6] The coating material for fried food according to claim 1 or 2, further comprising:

one starch or two starches (excluding the component (A))
25 selected from the group consisting of oxidized starch and crosslinked starch.

[Claim 7] The coating material for fried food according to claim 6,

wherein a mass ratio of a content of the starch to sum of a content of the component (A) and a content of the cellulose derivative (starch/(component (A) + cellulose derivative)) is 0.5 or more and 9 or less.

[Claim 8] A batter comprising:

the coating material according to claim 1 or 2.

10

[Claim 9] A breader comprising:

the coating material according to claim 1 or 2.

[Claim 10] A fried food comprising:

15

the coating material according to claim 1 or 2.

[Claim 11] A manufacturing method of fried food, comprising:

a step of coating outside of stuffing with the batter according to claim 8; and

20

a step of heating and cooking the batter-coated stuffing.

[Claim 12] A manufacturing method of fried food, comprising:

a step of coating outside of stuffing with the breader according to claim 9; and

25

a step of heating and cooking the breader-coated stuffing.

[Claim 13] The manufacturing method of fried food according to claim 11, further comprising:

a step of coating the outside of the stuffing with the breader according to claim 9, before the step of heating and
5 cooking.

[Claim 14] A method of improving texture of fried food, comprising:

a step of incorporating the following component (A) and a
10 cellulose derivative into a coating material for fried food,

component (A): a powdery granular material satisfying the following conditions (1) to (4),

(1) a starch content in the powdery granular material is 75% by mass or more,

15 (2) a content of a low-molecular-weight starch obtained from starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery granular material, and a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more and 5×10^4 or less,

20 (3) a cold water swelling degree of the powdery granular material at 25°C is 5 or more and 20 or less,

(4) a content of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm is 50% by mass or more and 100% by mass or
25 less in the powdery granular material.

[Claim 15] A method of improving texture in a case where fried food is reheated after storage, the method comprising:

a step of incorporating the following component (A) and a cellulose derivative into a coating material for fried food,

5 component (A): a powdery granular material satisfying the following conditions (1) to (4),

(1) a starch content in the powdery granular material is 75% by mass or more,

(2) a content of a low-molecular-weight starch obtained
10 from starch having an amylose content of 5% by mass or more is 3% by mass or more and 45% by mass or less in the powdery granular material, and a peak molecular weight of the low-molecular-weight starch is 3×10^3 or more and 5×10^4 or less,

(3) a cold water swelling degree of the powdery granular
15 material at 25°C is 5 or more and 20 or less,

(4) a content of a fraction that passes through a sieve having a mesh size of 3.35 mm and remains on a sieve having a mesh size of 0.038 mm is 50% by mass or more and 100% by mass or less in the powdery granular material.