

DESCRIPTION

Title of Invention: INSECT POWDER PRODUCTION METHOD

Technical Field

5 [0001]

The present invention relates to a method for producing insect powder.

Background Art

10 [0002]

In recent years, insect food has been attracting attention worldwide.

[0003]

15 Insect food has a lower environmental impact and cost in raising (production) compared to livestock, which is another source of protein. Furthermore, insect food has been attracting attention due to its high protein content and excellent nutritional value, fueled by growing global environmental awareness in recent years.

20 [0004]

On the other hand, insect food is often processed as insect powder into food products because there is a sense of resistance to its appearance. Such insect powder is generally produced by washing insects and subjecting them to dehydration, 25 drying, oil extraction, and other steps, followed by grinding.

[0005]

When processing insects that contain a lot of lipids, particularly those with a lipid content of more than 20%, into powder, a step of crushing the agglomerated powder is required.

30 [0006]

From the viewpoint of reducing costs, there is a strong demand for further simplifying the production steps described above.

35 Summary of Invention

#### Technical Problem

[0007]

In view of the above circumstances, an object of the present invention is to provide a more simplified method for  
5 producing insect powder.

#### Solution to Problem

[0008]

As a result of extensive research to solve the above  
10 problems, the present inventors found that by first performing a compression step after washing insects as appropriate, it is possible to omit steps such as oil extraction and crushing steps, thereby reducing costs and shortening the operation time. Upon further research based on this finding, the present inventors  
15 have completed the present invention.

[0009]

Specifically, the present invention provides the following method for producing insect powder.

Item 1.

20 A method for producing insect powder, comprising:  
step A of compressing an insect raw material; and  
step B of drying a compressed product obtained in step  
A.

Item 2.

25 The production method according to Item 1, further comprising step C of grinding a dried product obtained in step B.  
Item 3.

The production method according to Item 1 or 2, wherein the insect raw material is cricket.

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#### Advantageous Effects of Invention

[0010]

The method for producing insect powder according to the present invention described above can produce insect powder  
35 through simplified steps compared to conventional production

methods.

#### Brief Description of Drawings

[0011]

5                Fig. 1 is a schematic diagram of the method for producing insect powder of the present invention.

              Fig. 2 shows lipid content evaluation results for the Example and Comparative Example.

              Fig. 3 shows comparative data on production costs and  
10            operation time for the Example and Comparative Example.

#### Description of Embodiments

[0012]

              In the present specification, the term "comprise" or  
15            "contain" is a concept that encompasses all of the meanings of "comprise," "consist essentially of," and "consist of." Further, in the present specification, the numerical range indicated by "A to B" means A or more and B or less.

[0013]

20            The method for producing insect powder of the present invention includes, in this order, step A of compressing an insect raw material and step B of drying a compressed product obtained in step A.

[0014]

25            Regarding the insects to be used as the raw material, a wide range of known edible insects can be used without any particular limitations. Any of the following orders can be used: Coleoptera, Lepidoptera, Diptera, Hymenoptera, Hemiptera, Orthoptera, and Odonata.

30            [0015]

              However, from the viewpoint of superior nutritional value, it is preferable to use insects of the order Orthoptera, and it is particularly preferable to use insects of the order Orthoptera in the family Gryllidae.

35            [0016]

Before step A, it is preferable to wash the killed insects. The specific washing method is not particularly limited, and a wide range of known methods can be used. Specifically, a method such as boiling can be used.

5 [0017]

Step A

In step A, the insect raw material is compressed. The compression operation can be carried out using a wide range of known compression systems without any particular limitations.

10 Specific examples include any compression systems, such as a single-screw or twin-screw press (Angel twin-screw press), a filter press (Choquenot filter press), and a platen press.

[0018]

The conditions for the compression operation are  
15 appropriately determined depending on the type of insect used, and are not particularly limited. For example, the pressurization condition in the compression is preferably 30 MPa or more, and more preferably 35 MPa or more. The pressurization condition is also preferably 100 MPa or less, and more preferably 45 MPa or  
20 less. The pressurization time is preferably, for example, 1 minute or more, and more preferably 2 minutes or more. The pressurization time is also preferably 30 minutes or less, more preferably 10 minutes or less, and even more preferably 5 minutes or less.

25 [0019]

By performing compression, it is preferable to reduce the oil content in the insect raw material to less than 20 mass%, and more preferably 19% mass% or less, of the oil content in the insect raw material when compression is not performed (before  
30 compression).

[0020]

In conventional methods for producing insect powder, for example, in order to obtain low-lipid insect powder, such as low-lipid cricket powder, it is common to provide an oil  
35 extraction step after a step of dehydrating the insect raw

material. However, in the method of the present invention, a compression step is provided to combine dehydration and oil extraction steps, allowing the steps to be omitted. In the case of a high-lipid insect raw material, a crushing step is required since the powder tends to aggregate. However, in the production method of the present invention, lipid components are removed by providing a compression step, so that dehydration and crushing steps can be omitted.

[0021]

10 Step B

In step B, the compressed product obtained in step A is dried.

[0022]

The drying method is not particularly limited, and a wide range of known drying methods applicable to food can be used. Drying the compressed product by roasting is also a preferred embodiment.

[0023]

The drying conditions can be appropriately determined depending on the type and amount of the insect raw material used. By drying, it is preferable to reduce the water content to 20 mass% or less, and more preferably 15 mass% or less.

[0024]

Step C

25 It is also preferable to further provide step C after steps A and B. In step C, the dried product obtained in step B is ground.

[0025]

As the grinding method, it is possible to use a wide range of known methods used in the food industry, such as dry grinding, mortar grinding, jet mill grinding, high-speed rotary grinding, and airflow grinding, and there is no particular limitation.

[0026]

35 The size of the powder obtained by grinding can be

appropriately set depending on the type of insect raw material or the processing application of the obtained insect powder.

[0027]

As shown in Fig. 1, in a conventional method for  
5 producing insect powder, for example, in order to obtain low-lipid insect powder, it is necessary to extract lipids from the dried raw material (Fig. 1A). However, according to the production method of the present invention, for example, it is possible to simultaneously carry out dehydration and oil  
10 extraction steps by performing compression after washing. When using a high-lipid insect raw material, aggregation is likely to occur during production in the conventional method, necessitating a crushing step (Fig. 1B). However, in the production method of the present invention, a compression step can be first provided  
15 to perform dehydration and squeeze out lipids, making a crushing step unnecessary.

[0028]

The embodiments of the present invention are described above; however, the present invention is not limited to these  
20 examples. Needless to say, the present invention can be implemented in various forms without departing from the gist of the present invention.

#### Examples

25 [0029]

Embodiments of the present invention are described in more detail below based on Examples; however, the present invention is not limited thereto.

[0030]

30 Example 1

A cricket raw material was washed and then compressed at 35 MPa for 2 minutes. The resulting compressed product was placed in a roaster and roasted with the same heat setting until the product temperature reached 110°C. The resulting roasted  
35 product was then ground.

[0031]

#### Comparative Example 1

A cricket raw material the same as that in Example 1 was washed and centrifugally dehydrated, and then roasted with the same heat setting until the product temperature reached 110°C. The resulting roasted product was ground and then crushed.

[0032]

#### Lipid Content Evaluation Test

The mass (mass %) of lipids in each of the cricket powders of Example 1 and Comparative Example 1 was measured by the Soxhlet extraction method. Fig. 2 shows the results.

[0033]

#### Evaluation of Production Costs and Operation Time

Fig. 3 shows the production costs and operation time required for the production of Example 1 and Comparative Example 1. The results are shown as ratios, with the production costs and operation time in Comparative Example 1 set as 1.

CLAIMS

[Claim 1]

A method for producing insect powder, comprising:  
step A of compressing an insect raw material; and  
5 step B of drying a compressed product obtained in step  
A.

[Claim 2]

The production method according to claim 1, further  
10 comprising step C of grinding a dried product obtained in step B.

[Claim 3]

The production method according to claim 1 or 2,  
wherein the insect raw material is cricket.  
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