Description

Title of the invention: CULTURED MEAT-FILLED SPRAY

Technical Field

[0001]

The present invention relates to a cultured meat-filled spray.

Background Art

[0002]

In recent years, a demand for meat has risen with an increase in global population; utilization of alternative meat is required due to issues such as an increase in costs due to production of livestock and environmental concerns. As one type of alternative meat, cultured meat obtained by culturing animal cells and processing the cultured animal cells as a food is known. Since the cultured meat is produced by culturing the animal cells, problems associated with the production of livestock are solved.

[0003]

However, in order to mass-produce cultured meat while making the texture and flavor of the cultured meat comparable to those of typical meat, an increase in production cost cannot be avoided. Thus, it has been required to achieve mass-production of cultured meat while reducing the production cost. For this reason, Patent Document 1 and Patent Document 2, for example, propose a method for mass-producing cultured meat.

Citation List

Patent Documents

[0004]

Patent Document 1: JP 2022-532498 W

Patent Document 2: JP 2023-047559 A

Summary of Invention

Technical Problem

[0005]

In the known art, it has been studied to reproduce a three-dimensional structure of muscle cells such as steak meat by cultured meat and use the cultured meat as traditional meat. However, conducting studies by focusing on the fact that the cultured meat composed of a single cell, the present inventors have found that a method for using cultured meat different from a known method can be found.

[0006]

Thus, the present inventors have completed the present invention as a result of further studies on the use of cultured meat, which is a single cell.

Solution to Problem

[0007]

A cultured meat-filled spray according to the present invention includes an aerosol container, and the aerosol container is configured to be filled with: a cultured meat dispersion in which a cultured meat, obtained by culturing animal cells, and a preservation solution for preserving the cultured meat in a dispersed state are mixed; and a propellant for discharging the cultured meat dispersion from the aerosol container.

Advantageous Effects of Invention

[0008]

According to the present invention, it is possible to provide a cultured meat-filled spray that can use cultured meat in a novel manner.

Brief Description of Drawings

[0009]

FIG. 1 is an explanatory view illustrating an outline of a cultured meat-filled spray according to an example of the present embodiment.

FIG. 2 is an explanatory view illustrating an outline of the cultured meat-filled spray according to another example of the present embodiment.

Description of Embodiments

[0010]

Preferred embodiments of the present invention will be described below with reference to the accompanying drawings.

[0011]

First Embodiment

First, the first embodiment of the present invention will be described.

[0012]

FIG. 1 is an explanatory view illustrating an outline of a cultured meat-filled spray 1 according to the present embodiment, and schematically illustrates a state of the cultured meat-filled spray 1 as viewed from the side.

[0013]

The cultured meat-filled spray 1 includes an aerosol container 3. The aerosol container 3 is filled with: a cultured meat dispersion 7 in which cultured meat 4, obtained by culturing animal cells, and a preservation solution 5 for preserving the cultured meat 4 in a dispersed state

are mixed; and a propellant 6 for discharging the cultured meat dispersion 7 from the aerosol container 3. The cultured meat 4 is cultured meat for human consumption.

[0014]

Examples of the animal cell used for culturing the cultured meat 4 include mammals such as monkey, cow, horse, pig, sheep, goat, dog, cat, guinea pig, rat, and mouse, birds such as ostrich, chicken, duck, and sparrow, reptiles such as snake, crocodile, lizard, and turtle, amphibians such as frog, newts, and salamander, fish such as salmon, tuna, shark, sea bream, and carp, crustaceans such as shrimp and crab, and mollusks such as squid and octopus.

[0015]

The aerosol container 3 is a pressure resistant container made of metal such as aluminum alloy. The aerosol container 3 includes an aerosol valve 13. The aerosol valve 13 is provided with a stem 9 that is vertically movable in a housing 8. An actuator 10 is provided above the stem 9. A dip tube 11 is provided at a lower end of the housing 8. One end of the dip tube 11 communicates with a stem passage of the stem 9, and the other end extends toward the bottom of the aerosol container 3. The actuator 10 includes a discharge port 12. The discharge port 12 communicates with the stem passage of the stem 9.

[0016]

When the actuator 10 is in the non-operative state and no pressing operation is applied, the stem 9 is pushed upward by a spring (not illustrated), and the stem passage of the stem 9 is blocked from an inside of the aerosol container 3. When the actuator 10 is in the operative state and pressing operation is applied, the stem 9 is pressed so that the stem passage communicates with the inside of the aerosol container 3. As a result, the cultured meat dispersion 7 edible by human beings by the pressure of the propellant 6 passes through the dip tube 11 and is discharged from the discharge port 12 in the form of paste, mist, or foam.

[0017]

A low adhesion layer that suppresses adhesion of the cultured meat dispersion 7 is provided at the surface of the aerosol container 3 in contact with the cultured meat dispersion 7. The low adhesion layer is provided, for example, by coating with a cell low adhesive polymer. The cell low adhesive polymer can be suitably applied using, for example, a bar coater or a gravure coater. Examples of the cell low adhesive polymer include a phospholipid polymer, a polyvinyl alcohol derivative, a phospholipid/polymer complex, polyhydroxyethyl methacrylate, polyvinyl alcohol, agarose, chitosan, polyethylene glycol, and albumin. In addition, these may be used in combination. The low adhesion layer is not limited by the present embodiment and can be formed by a known method, as long as the layer can be formed as applicable to food applications by coating, vapor deposition, coating, and the like.

[0018]

Here, when the foamy cultured meat dispersion 7 is discharged, additives such as a surfactant and a thickener are blended into the cultured meat dispersion 7. As the propellant 6,

for example, an inert gas such as carbon dioxide gas or nitrous oxide gas is preferably used. When carbon dioxide gas or nitrous oxide gas is used as the propellant 6, in the aerosol container 3, the propellant 6 exists as a gas phase above the cultured meat dispersion 7 and is dissolved in the cultured meat dispersion 7. When the cultured meat dispersion 7 is discharged, the propellant 6 in the cultured meat dispersion 7 depressurized expands to form a gas phase, and the foamy cultured meat dispersion 7 can be discharged. The foaming power, shape retention, and the like, of the foam can be appropriately adjusted depending on the type and amount of the surfactant or thickener to be added.

[0019]

In both the case of discharging the misty cultured meat dispersion 7 and the case of discharging the cultured meat dispersion 7 in the form of paste, it is preferable to use, for example, an inert gas such as nitrogen gas as the propellant 6. When nitrogen gas is used as the propellant 6, in the aerosol container 3, the propellant 6 exists as a gas phase above the cultured meat dispersion 7. When a groove for forming the cultured meat dispersion 7 into the form of mist or paste is formed in the actuator 10, the misty or pasty cultured meat dispersion 7 can be discharged.

[0020]

In a filling ratio of the cultured meat dispersion 7 and the propellant 6 in the aerosol container 3 filled without separating the cultured meat dispersion 7 and the propellant 6, the ratio of the cultured meat dispersion 7 is preferably from 92 to 99.9 wt%, and the ratio of the propellant 6 is preferably from 0.1 to 8 wt%.

[0021]

Here, in the aerosol container 3 in which the cultured meat dispersion 7 and the propellant 6 are filled without being separated, it is preferable to use water, edible oil, ethanol, or a mixture thereof as the preservation solution 5 in order to preserve the cultured meat dispersion 7 so as to be dischargeable from the aerosol container 3 while maintaining the dispersed state of the cultured meat dispersion 7. An osmotic pressure of the preservation solution 5 is preferably about from 28 to 6000 mOsm/kg, and more preferably about from 56 to 560 mOsm/kg.

[0022]

In addition, in order to discharge the cultured meat dispersion 7 in the form of mist from the aerosol container 3, an inert gas such as nitrogen gas is used as the propellant 6, and the viscosity of the cultured meat dispersion 7 is preferably 500 mPa·s or less, and more preferably 100 mPa·s or less. In order to discharge the cultured meat dispersion 7 in the form of foam from the aerosol container 3, an inert gas such as carbon dioxide gas or nitrous oxide gas is used as the propellant 6, and the viscosity of the cultured meat dispersion 7 is preferably 50000 mPa·s or less, and more preferably 10000 mPa·s or less. In order to discharge the cultured meat dispersion 7 in the form of paste from the aerosol container 3, an inert gas such as nitrogen gas is used as

the propellant 6, and the viscosity of the cultured meat dispersion 7 is preferably 100000 mPa·s or less, and more preferably 10000 mPa·s or less.

[0023]

There is a limit to miniaturization of traditional meat, and it is difficult for the traditional meat to be atomized. However, since the cultured meat 4 is a single cell, the cultured meat can be discharged from the aerosol container 3. The filling amount into the aerosol container 3 can also be managed in units of several ml. As described above, by focusing on the fact that the cultured meat 4 is a single cell, it is possible to use the cultured meat 4 by an unusual method without processing the cultured meat 4 into a steak meat shape.

[0024]

By directly spraying the cultured meat dispersion 7 from the aerosol container 3 on, for example, rice, salad, and the like, it is possible to add a meaty flavor to eat these foods.

[0025]

Second Embodiment

The second embodiment of the present invention will be described. The same components as those of the first embodiment are denoted by the same reference numerals, and detailed description thereof will be omitted.

[0026]

FIG. 2 is an explanatory view illustrating an outline of a cultured meat-filled spray 20 according to the present embodiment, and schematically illustrates a state of the cultured meat-filled spray 20 as viewed from the side.

[0027]

The cultured meat-filled spray 20 includes an aerosol container 21. The aerosol container 21 is a pressure resistant container made of metal such as aluminum alloy. The aerosol container 21 includes an aerosol valve 22. The aerosol container 21 includes an aluminum pouch 23 therein. The inside of the aluminum pouch 23 is a cultured meat dispersion filling space 24 for filling the cultured meat dispersion 7. It is preferable that the cultured meat 4 is uniformly dispersed in the cultured meat dispersion 7. A gap between the aerosol container 21 and the aluminum pouch 23 is a propellant filling space 25 for filling the propellant 6. The aerosol valve 22 is provided with a stem 27 that is vertically movable in a housing 26. An inner edge portion along an opening at an upper end of the aluminum pouch 23 is adhered to an outer periphery of the housing 26. An actuator 28 is provided above the stem 27. A dip tube 29 is provided at a lower end of the housing 26. One end of the dip tube 29 communicates with a stem passage of the stem 27, and the other end extends toward a bottom of the aluminum pouch 23 in the cultured meat dispersion filling space 24.

[0028]

The actuator 28 includes a discharge port 30. The discharge port 30 communicates with the stem passage of the stem 27. As described above, by providing the actuator 28 on the stem 27

communicating with the cultured meat filling space 24 through the dip tube 29, a discharge mechanism for discharging the cultured meat dispersion 7 filled in the cultured meat filling space 24 is formed.

[0029]

When the propellant 6 is filled in the propellant filling space 25, the aluminum pouch 23 is always pressurized by the propellant 6. When the actuator 28 is in the non-operative state and no pressing operation is applied, the stem 27 is pushed upward, and the stem passage of the stem 35 is blocked from an inside of the aerosol container 20. When the actuator 28 is in the operative state and pressing operation is applied, the stem 27 is pressed so that the stem passage communicates with the inside of the aerosol container 20. As a result, the aluminum pouch 23 is contracted by the pressure of the propellant 6. When the aluminum pouch 23 contracts, the human-edible cultured meat dispersion 7 filled in the cultured meat filling space 24 passes through the dip tube 29 and is discharged in the form of mist or paste from the discharge port 30.

[0030]

A low adhesion layer that suppresses adhesion of the cultured meat dispersion 7 is provided at the surface of the aerosol container 3 in contact with the cultured meat dispersion 7. The low adhesion layer is provided, for example, by coating with a cell low adhesive polymer. The cell low adhesive polymer can be suitably applied using, for example, a bar coater or a gravure coater. Examples of the cell low adhesive polymer include a phospholipid polymer, a polyvinyl alcohol derivative, a phospholipid/polymer complex, polyhydroxyethyl methacrylate, polyvinyl alcohol, agarose, chitosan, polyethylene glycol, and albumin. In addition, these may be used in combination. The low adhesion layer is not limited by the present embodiment and can be formed by a known method as long as the layer can be formed as applicable to food applications by coating, vapor deposition, coating, and the like.

[0031]

Here, in both the case of discharging the misty cultured meat dispersion 7 and the case of discharging the pasty cultured meat dispersion 7, it is preferable to use, for example, an inert gas such as nitrogen gas as the propellant 6. When a groove for forming the cultured meat dispersion 7 into the form of mist or paste is formed in the actuator 28, the misty or pasty cultured meat dispersion 7 can be discharged.

[0032]

The pressure (gauge pressure) in the aerosol container 20 including the cultured meat filling space 24 and the propellant filling space 25 is preferably from 0.1 MPa to 1.0 MPa and more preferably from 0.2 MPa to 0.9 MPa in a state where a prescribed amount of the cultured meat dispersion 7 is filled and the temperature is 25°C.

[0033]

Here, in the aerosol container 20 including the cultured meat filling space 24 and the propellant filling space 25, it is preferable to use water, edible oil, ethanol, or a mixture thereof

as the preservation solution 5 to be mixed as the solvent of the cultured meat 4 in order to obtain the cultured meat dispersion 7 which stores the cultured meat 4 so as to be dischargeable from the aerosol container 3 while keeping the cultured meat 4 in the dispersed state. An osmotic pressure of the preservation solution 5 is preferably about from 28 to 6000 mOsm/kg, and more preferably about from 56 to 560 mOsm/kg.

[0034]

In addition, in order to discharge the cultured meat dispersion 7 in the form of mist from the aerosol container 21, an inert gas such as nitrogen gas is used as the propellant 6, and the viscosity of the cultured meat dispersion 7 is preferably 500 mPa·s or less, and more preferably 100 mPa·s or less. In order to discharge the cultured meat dispersion 7 in the form of paste from the aerosol container 21, an inert gas such as nitrogen gas is used as the propellant 6, and the viscosity of the cultured meat dispersion 7 is preferably 100000 mPa·s or less, and more preferably 10000 mPa·s or less.

[0035]

In the cultured meat-filled spray 20 according to the second embodiment, the propellant 6 may be filled in the cultured meat filling space 24, and the foamy cultured meat dispersion 7 may be discharged similarly to the cultured meat-filled spray 1 according to the first embodiment.

[0036]

The cultured meat-filled spray 20 according to the second embodiment can obtain the same effects as those of the cultured meat-filled spray 1 according to the first embodiment. In addition, since the cultured meat dispersion 7 is discharged by pressurizing the aluminum pouch 23, the cultured meat dispersion 7 having a higher viscosity than that of the cultured meat-filled spray 1 can be discharged. Since the cultured meat dispersion 7 and the propellant 6 are separated, it is possible to suppress the cultured meat dispersion 7 from being deteriorated due to an influence of the propellant 6. By making variations in the size of the aluminum pouch 23, variations in the content amount can be increased. The cultured meat dispersion 7 can be discharged regardless of the orientation of the aerosol container 20.

[0037]

In the present embodiment, it has been described that the cultured meat and cultured meat dispersion are edible for humans or pets; while the pets are not limited to the following, pets such as dogs, cats, and fish are suitable.

[0038]

In the first embodiment and the second embodiment, the example in which the aerosol container is made of metal has been described; however, a pressure resistant container made of resin or glass may be used as the aerosol container.

[0039]

In the first embodiment and the second embodiment, the example in which the dip tube is provided in the aerosol container has been described; however, the shape is not limited to a tubular form, and a known shape may be used, or the dip tube may not be provided.

[0040]

In the second embodiment, the example in which the aluminum pouch 23 is provided has been described; however, a layer configuration of the pouch may be a multilayer or single layer structure, and a pouch not including an aluminum layer may be used. In addition, a resin inner bag may be used instead of the pouch. The pouch and the resin inner bag preferably include a gas barrier layer.

[0041]

In the second embodiment, while the example where the cultured meat dispersion 7, obtained by mixing the cultured meat 4 and the preservation solution 5, is filled in the cultured meat filling space 24 has been described, a foaming agent may be filled in the cultured meat filling space 24.

[0042]

In the second embodiment, the example in which one aluminum pouch 23 is provided has been described; however, a plurality of the aluminum pouches 23 may be provided to simultaneously discharge different types (flavor, viscosity, etc.) from a plurality of the cultured meat filling spaces 24. For example, any one of the plurality of cultured meat filling spaces 24 can be filled with the cultured meat dispersion 7, and the other cultured meat filling spaces 24 can be filled with seasoning for seasoning the cultured meat dispersion 7.

Reference Signs List

[0043]

1 Cultured meat-filled spray
3 Aerosol container
4 Cultured meat
5 Preservation solution
6 Propellant
7 Cultured meat dispersion
20 Cultured meat-filled spray
21 Aerosol container
24 Cultured meat filling space
25 Propellant filling space

Claims

[Claim 1]

A cultured meat-filled spray, comprising an aerosol container,

wherein the aerosol container is filled with:

a cultured meat dispersion in which cultured meat, obtained by culturing animal cells, and a preservation solution for preserving the cultured meat in a dispersed state are mixed; and

a propellant for discharging the cultured meat dispersion from the aerosol container.

[Claim 2]

The cultured meat-filled spray according to claim 1, wherein the aerosol container comprises:

a propellant filling space for filling the propellant,

a cultured meat dispersion filling space for filling the cultured meat dispersion, and

a discharge mechanism configured to discharge the cultured meat dispersion filled in the cultured meat filling space.

[Claim 3]

The cultured meat-filled spray according to claim 1, wherein the propellant contains nitrogen gas, and a viscosity of the cultured meat dispersion is 500 mPa·s or less.

[Claim 4]

The cultured meat-filled spray according to claim 1, wherein the propellant contains carbon dioxide gas or nitrous oxide gas, and a viscosity of the cultured meat dispersion is 50000 mPa·s or less.

[Claim 5]

The cultured meat-filled spray according to claim 1, wherein the cultured meat to be mixed with the cultured meat dispersion is cultured meat for consumption by humans or pets.

[Claim 6]

The cultured meat-filled spray according to claim 1, wherein, at a surface of the aerosol container in contact with the cultured meat dispersion, a low adhesion layer configured to suppress adhesion of the cultured meat dispersion is provided.