temperature for 30 minutes.

The marinated cubes were drained, placed in a steamer and steamed with constant agitation until well-done, and then cooled in a freezer. The meat was then placed in a freeze dryer and refrigerated at -25 °C for 2 hours prior to commencing the dehydration process. The conditions for dehydration were as follows:

drying plate temperature	60 °C
pressure	400 millitorrs
condenser temperature	-40 °C
maximum temperature of product	50 °C

The moisture content of the dried meat was 2%. The freeze-dried meat was afterwards packed in 150 ml aluminium cans (each containing about 24.2 g meat) in nitrogen by vacuuming the chamber down to 94.6 kPa (710 mm Hg) then flushing nitrogen back before sealing.

The ethane production in the headspace measured by gas chromatographic analysis after 18 months storage at 20 °C was 0.8 ppm. This indicates excellent storage stability.

Example 2

A similar procedure to that described in Example 1 was followed except that, instead of sodium bicarbonate, a similar quantity of trisodium pyrophosphate was used. The ethane production in the headspace after 18 months storage at 20 °C was 0.8 ppm indicating excellent storage stability.

Comparative Example A

A similar procedure to that described in Example 1 or 2 was followed but without the marination treatment. The ethane production in the headspace after 18 months storage at 20 °C was 3.1 ppm which indicates significantly poorer storage stability to that of the meat product of Examples 1 and 2.

Example 3

A similar procedure to that described in Example 1 was followed except that the beef was packed in air instead of nitrogen. The ethane production in the headspace after 18 months storage at 20 °C was 2.6 ppm which indicates very good stability.

Comparative Example B

In a similar procedure to that described in Example 3 but without the marination treatment, the ethane production in the headspace after 18 months storage at 20 °C was 6.0 ppm which is significantly poorer than that of the product of Example 3.

Example 4

A similar procedure to that described in Example 1 was carried out but using pork instead of beef. The ethane production in the headspace after 6 months storage at 37 °C was 2.2 ppm which indicates excellent storage stability.

Comparative Example C

In a similar procedure to that described in Example 4 but without the marination treatment, a freeze dried pork product was obtained. The ethane production in the headspace after 6 months storage at 37 °C was 8.4 ppm which is significantly poorer than that of the product of Example 4.

Example 5

A similar procedure to that described in Example 4 was followed except that the pork was packed in air instead of nitrogen. The ethane production in the headspace after 6 months storage at 37 °C was 3.8 ppm which indicates very good storage stability.

Comparative Example D

In a similar procedure to that described in Example 5 but without the marination treatment, the ethane production in the headspace after 6 months storage at 37 °C was 22.2 ppm which is significantly worse than that of the product of Example 5.

Example 6

75 parts of pre-cooked ground beef, 20 parts of soy protein and 5 parts of fresh egg white were mixed and blended with 0.05 parts of ascorbic acid and 0.15 parts of a Maillard reaction meat flavour prepared by reacting protein hydrolysate, cysteine and thiamine with reducing sugar, then extruded and granulated to cylindrical pellets with a diameter of 0.5 cm and a length of 1 cm. The granulated reconstituted meat was dehydrated by using a fluidised bed dryer in which the drying cycles were:

1) 100 °C for 30 minutes,
2) 70 °C for 60 minutes and
3) 60 °C for 60 minutes.

The fluidised bed dryer was preheated to the desired temperature prior to meat introduction and the product was dried to a moisture content below 3%. The dehydrated meat was afterwards packed with oxygen - impermeable packing materials in nitrogen. The product showed good storage stability.

Claims

1. A process for the preparation of a dehydrated meat product which comprises contacting the meat with ascorbic acid or a salt thereof and a Maillard reaction meat flavour derived from a protein hydrolysate to provide effective penetration into the meat, cooking, and finally drying the meat.

2. A process according to claim 1 wherein the amount of ascorbic acid or salt thereof absorbed by the meat is from 0.01 to 0.5% by weight based on the weight of the meat.

3. A process according to claim 1 wherein the amount of the Maillard reaction meat flavour absorbed by the meat is from 0.01 to 1.0% by weight based on the weight of the meat.

4. A process according to claim 1 wherein the meat is genuine meat.

5. A process according to claim 4 wherein, before contacting with the ascorbic acid or salt thereof and the Maillard reaction meat flavour, the meat is diced into pieces having a volume from 0.03 to 6.9 cm^3 (cc).

6. A process according to claim 4 wherein the meat is contacted with a dilute aqueous solution containing the ascorbic acid or salt thereof and the Maillard reaction meat flavour by marinading.

7. A process according to claim 6 wherein the amount of ascorbic acid or salt thereof in the aqueous solution is from 0.1 to 10% by weight based on the weight of the solution.

8. A process according to claim 6 wherein the amount of Maillard reaction meat flavour in the aqueous solution is from 0.2 to 20% by weight based on the weight of the solution.

9. A process according to claim 6 wherein the pH during the contacting is from 6.0 to 7.5.

10. A process according to claim 6 wherein the pH during the contacting is substantially neutral.

11. A process according to claim 6 wherein the pH is adjusted during the contacting by sodium bicarbonate.

12. A process according to claim 4 wherein the meat is cooked after contacting with ascorbic acid or a salt thereof and the Maillard reaction meat flavour.

13. A process according to claim 4 wherein the genuine meat is dried by freeze-drying.

Comparative Example D

In a similar procedure to that described in Example 5 but without the marination treatment, the ethane production in the headspace after 6 months storage at 37 °C was 22.2 ppm which is significantly worse than that of the product of Example 5.

Example 6

75 parts of pre-cooked ground beef, 20 parts of soy protein and 5 parts of fresh egg white were mixed and blended with 0.05 parts of ascorbic acid and 0.15 parts of a Maillard reaction meat flavour prepared by reacting protein hydrolysate, cysteine and thiamine with reducing sugar, then extruded and granulated to cylindrical pellets with a diameter of 0.5 cm and a length of 1 cm. The granulated reconstituted meat was dehydrated by using a fluidised bed dryer in which the drying cycles were:

1) 100 °C for 30 minutes,
2) 70 °C for 60 minutes and
3) 60 °C for 60 minutes.

The fluidised bed dryer was preheated to the desired temperature prior to meat introduction and the product was dried to a moisture content below 3%. The dehydrated meat was afterwards packed with oxygen - impermeable packing materials in nitrogen. The product showed good storage stability.

Claims

1. A process for the preparation of a dehydrated meat product which comprises contacting the meat with ascorbic acid or a salt thereof and a Maillard reaction meat flavour derived from a protein hydrolysate to provide effective penetration into the meat, cooking, and finally drying the meat.

2. A process according to claim 1 wherein the amount of ascorbic acid or salt thereof absorbed by the meat is from 0.01 to 0.5% by weight based on the weight of the meat.

3. A process according to claim 1 wherein the amount of the Maillard reaction meat flavour absorbed by the meat is from 0.01 to 1.0% by weight based on the weight of the meat.

4. A process according to claim 1 wherein the meat is genuine meat.

5. A process according to claim 4 wherein, before contacting with the ascorbic acid or salt thereof and the Maillard reaction meat flavour, the meat is diced into pieces having a volume from 0.03 to 6.9 cm^3 (cc).

6. A process according to claim 4 wherein the meat is contacted with a dilute aqueous solution containing the ascorbic acid or salt thereof and the Maillard reaction meat flavour by marinading.

7. A process according to claim 6 wherein the amount of ascorbic acid or salt thereof in the aqueous solution is from 0.1 to 10% by weight based on the weight of the solution.

8. A process according to claim 6 wherein the amount of Maillard reaction meat flavour in the aqueous solution is from 0.2 to 20% by weight based on the weight of the solution.

9. A process according to claim 6 wherein the pH during the contacting is from 6.0 to 7.5.

10. A process according to claim 6 wherein the pH during the contacting is substantially neutral.

11. A process according to claim 6 wherein the pH is adjusted during the contacting by sodium bicarbonate.

12. A process according to claim 4 wherein the meat is cooked after contacting with ascorbic acid or a salt thereof and the Maillard reaction meat flavour.

13. A process according to claim 4 wherein the genuine meat is dried by freeze-drying.

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14. A process according to claim 1 wherein the meat is disintegrated meat.

15. A process according to claim 14 wherein the disintegrated meat is contacted directly with the ascorbic acid or salt thereof and the Maillard reaction meat flavour in the absence of water prior to reconstitution/shaping.

16. A process according to claim 14 wherein the cooking of the meat is carried out prior to grinding, prior to reconstitution or after reconstitution.

17. A process according to claim 14 wherein the reconstituted meat is dried by fluidised bed drying.

18. A process according to claim 1 wherein the dried meat is afterwards packed in nitrogen.

Patentansprüche

1. Verfahren zur Herstellung eines dehydratisierten Fleischproduktes, welches das Inberührungbringen des Fleisches mit Ascorbinsäure oder einem Salz derselben und mit einem Maillard-Reaktions-Fleischgeschmacksstoff, welcher aus einem Protein-Hydrolysat stammt, zwecks Erzielung eines wirksamen Eindringens in das Fleisch, das Kochen und schließlich das Trocknen des Fleisches umfaßt.

2. Verfahren nach Anspruch 1, wobei die Menge der Ascorbinsäure oder von deren Salz, welche von dem Fleisch absorbiert wird, 0,01 bis 0,5 Gew.-%, bezogen auf das Gewicht des Fleisches, beträgt.

3. Verfahren nach Anspruch 1, wobei die von dem Fleisch absorbierte Menge des Maillard-Reaktions-Fleischgemschacksstoffes 0,01 bis 1,0 Gew.-%, bezogen auf das Gewicht des Fleisches, beträgt.

4. Verfahren nach Anspruch 1, wobei das Fleisch Frischfleisch ist.

5. Verfahren nach Anspruch 4, wobei das Fleisch, bevor es mit der Ascorbinsäure oder einem Salz derselben und mit dem Maillard-Reaktions-Fleischgeschmacksstoff in Berührung gebracht wird, zu würfelförmigen Stückchen eines Volumens von 0,03 bis 6,9 cm^3 (cc) zerschnitten wird.

6. Verfahren nach Anspruch 4, wobei das Fleisch durch Marinieren mit einer verdünnten wässerigen lösung in Berührung gebracht wird, welche die Ascorbinsäure oder ein Salz derselben und den Maillard-Reaktions-Fleischgeschmacksstoff enthält.

7. Verfahren nach Anspruch 6, wobei die Menge der Ascorbinsäure oder von deren Salz in der wässerigen Lösung 0,1 bis 10 Gew.-%, bezogen auf das Gewicht der Lösung, beträgt.

8. Verfahren nach Anspruch 6, wobei die Menge des Maillard-Reaktions-Fleischgeschmacksstoffes in der wässrigen Lösung 0,2 bis 20 Gew.-%, bezogen auf das Gewicht der Lösung, beträgt.

9. Verfahren nach Anspruch 6, wobei der pH-Wert während des Inberührungbringens 6,0 bis 7,5 beträgt.

10. Verfahren nach Anspruch 6, wobei der pH-Wert während des Inberührungbringens im wesentlichen neutral ist.

11. Verfahren nach Anspruch 6, wobei der pH-Wert während des Inberührungbringens mit Natriumbicarbonat eingestellt wird.

12. Verfahren nach Anspruch 4, wobei das Fleisch, nachdem es mit der Ascorbinsäure oder einem Salz derselben und mit dem Maillard-Reaktions-Fleischgeschmacksstoff in Berührung gebracht worden ist, gekocht wird.

13. Verfahren nach Anspruch 4, wobei das Frischfleisch durch Gefriertrocknen getrocknet wird.

14. Verfahren nach Anspruch 1, wobei das Fleisch zerkleinertes Fleisch ist.

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15. Verfahren nach Anspruch 14, wobei das zerkleinerte Fleisch vor dem Rekonstituieren/Formen und in Abwesenheit von Wasser direkt mit der Ascorbinsäure oder mit einem Salz derselben und mit dem Maillard-Resktions-Fleischgeschmacksstoff in Berührung gebracht wird.

16. Verfahren nach Anspruch 14, wobei das Kochen des Fleisches vor dem Zerkleineren, vor dem Rekonstituieren oder nach dem Rekonstituieren durchgeführt wird.

17. Verfahren nach Anspruch 14, wobei das rekonstituierte Fleisch durch Fließbetttrocknung getrocknet wird.

18. Verfahren nach Anspruch 1, wobei das getrocknete Fleisch anschließend unter Stickstoff verpackt wird.

Revendications

1. Procédé de préparation d'un produit à base de viande déshydratée qui comprend la mise en contact de la viande avec de l'acide ascorbique ou un de ses sels et un arôme de viande formé par réaction de Maillard, dérivé d'un hydrolysat de protéine, pour provoquer une pénétration efficace dans la viande, une cuisson et, finalement, un séchage de la viande.

2. Procédé suivant la revendication 1, dans lequel la quantité d'acide ascorbique ou de son sel absorbée par la viande est comprise dans l'intervalle de 0,01 à 0,5 % en poids sur la base du poids de la viande.

3. Procédé suivant la revendication 1, dans lequel la quantité de l'arôme de viande formé par réaction de Maillard, absorbée par la viande, est comprise dans l'intervalle de 0,01 à 1,0 % en poids sur la base du poids de la viande.

4. Procédé suivant la revendication 1, dans lequel la viande est de la viande naturelle.

5. Procédé suivant la revendication 4, dans lequel, avant mise en contact avec l'acide ascorbique ou son sel et l'arôme de viande formé par réaction de Maillard, la viande est coupée en morceaux ayant un volume de 0,03 à 6,9 cm^3.

6. Procédé suivant la revendication 4, dans lequel la viande est mise en contact par marinage avec une solution aqueuse diluée contenant l'acide ascorbique ou son sel et l'arôme de viande formé par réaction de Maillard.

7. Procédé suivant la revendication 6, dans lequel la quantité d'acide ascorbique ou de son sel dans la solution aqueuse est comprise dans l'intervalle de 0,1 à 10 % en poids, sur la base du poids de la solution.

8. Procédé suivant la revendication 6, dans lequel la quantité d'arôme de viande formé par réaction de Maillard dans la solution aqueuse est comprise dans l'intervalle de 0,2 à 20 % en poids sur la base du poids de la solution.

9. Procédé suivant la revendication 6, dans lequel le pH au cours de la mise en contact est compris dans l'intervalle de 6,0 à 7,5.

10. Procédé suivant la revendication 6, dans lequel le pH au cours de la mise en contact est pratiquement le pH neutre.

11. Procédé suivant la revendication 6, dans lequel le pH est ajusté avec du bicarbonate de sodium au cours de la mise en contact.

12. Procédé suivant la revendication 4, dans lequel la viande est cuite après mise en contact avec l'acide ascorbique ou un de ses sels et l'arôme de viande formé par réaction de Maillard.

13. Procédé suivant la revendication 4, dans lequel la viande naturelle est séchée par lyophilisation.

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14. Procédé suivant la revendication 1, dans lequel la viande est de la viande désagrégée.

15. Procédé suivant la revendication 14, dans lequel la viande désagrégée est mise en contact directement avec l'acide ascorbique ou son sel et l'arôme de viande formé par réaction de Maillard, en l'absence d'eau, avant reconstitution/façonnage.

16. Procédé suivant la revendication 14, dans lequel la cuisson de la viande est effectuée avant de hacher la viande, avant reconstitution ou après reconstitution.

17. Procédé suivant la revendication 14, dans lequel la viande reconstituée est séchée par séchage en lit fluidisé.

18. Procédé suivant la revendication 1, dans lequel la viande séchée est ensuite emballée sous atmosphère d'azote.

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