



COMMONWEALTH of AUSTRALIA

PATENTS ACT 1952

609104

APPLICATION FOR A STANDARD PATENT

We

W. R. Grace & Co.-Conn., of  
1114 Avenue of the Americas,  
New York,  
New York 10036,  
United States of America

hereby apply for the grant of a Standard Patent for an invention entitled:

"METHOD FOR SALTING MEAT"

which is described in the accompanying ~~provisional~~ complete specification.

Details of basic application(s):—

<u>Number</u>	<u>Convention Country</u>	<u>Date</u>
8707845	United Kingdom	2 April, 1987

APPLICATION ACCEPTED AND AMENDMENTS  
ALLOWED 5.2.91

The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

Dated this 24th day of July, 19 89.

To: THE COMMISSIONER OF PATENTS

(a member of the firm of DAVIES & COLLISON for and on behalf of the Applicant).

COMMONWEALTH OF AUSTRALIA  
PATENTS ACT 1952  
DECLARATION IN SUPPORT OF CONVENTION OR  
NON-CONVENTION APPLICATION FOR A PATENT

In support of the Application made for a patent for an invention entitled:

"METHOD FOR SALTING MEAT"

I, Ronald A. Bleeker, Assistant Secretary of W. R. GRACE & CO., of 1114 Avenue of the Americas, New York, New York, 10036, U.S.A., do solemnly and sincerely declare as follows:

1. (a) I am authorized by W. R. GRACE & CO., the applicant for the patent to make this declaration on its behalf.

(b) Raymond George Parker, 20 Highworth Close, Totteridge, High Wycombe, Bucks HP13 - 7PJ, London, England

is ~~xxx~~ the actual inventor... of the invention and the facts upon which the applicant is entitled to make the application are as follows:

The said applicant is the assignee of the said actual inventor in respect of the invention.

2. The basic application....as defined by Section 141 of the Act was made in Great Britain on the 2nd April 1987 by W. R. Grace & Co.

3. The aforesaid basic application was ~~xxxx~~ the first application...made in a Convention country in respect of the invention the subject of the application.

Declared at New York, New York, this 8<sup>th</sup> day of February, 1988.

Ronald A. Bleeker  
Ronald A. Bleeker  
Assistant Secretary

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**(12) PATENT ABRIDGMENT (11) Document No. AU-B-13708/88**  
**(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 609104**

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(54) Title  
METHOD FOR CURING MEAT BY BRINE INJECTION

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(56) Prior Art Documents  
US 4463027  
GB 967578  
GB 1014701

(57) Claim

1. Method for curing meat with salt which comprises injecting into meat saturated brine having suspended therein solid salt having a particle size not greater than 100 micrometres.

2. Process according to claim 1 in which the salt has a particle size less than 50 micrometres.

11. A meat product when produced by a process according to any one of claims 1 to 10.

COMMONWEALTH OF AUSTRALIA

PATENT ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

609104

FOR OFFICE USE

CLASS

INT. CLASS

Application Number:  
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Complete Specification Lodged:  
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Priority:

Related Art:

This document contains the amendments made under Section 49 and is correct for printing

NAME OF APPLICANT: W. R. GRACE & CO. - CONN

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NAME(S) OF INVENTOR(S) Raymond George PARKER

ADDRESS FOR SERVICE: DAVIES & COLLISON, Patent Attorneys  
1 Little Collins Street, Melbourne, 3000.

COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:  
"METHOD FOR SALTING MEAT"

The following statement is a full description of this invention,  
including the best method of performing it known to us :-

This invention relates to the salting (curing) of meat, especially pork to produce bacon. As used herein, the term "bacon" is used generically to cover all pork-derived products which are sold after salting, e.g. gammon, collar, hock, and slipper, as well as the various forms of bacon itself.

Meat is customarily preserved by treatment with salt. For this purpose the salt must penetrate the interior of the meat. To speed up this process, it is customary to inject brine, i.e. salt solution, into the meat through fine nozzles. The meat so injected may then be immersed in brine to complete the process. Current food regulations require that meat which contains more than 10% of added water must be labelled to show the amount of water added. It is therefore normal practice to sell meat containing not more than 10% of added water. The shelf life of salted meat depends upon the salt content. For a shelf life of about four weeks, which is appropriate for retailers who have a rapid turnover of stock, a salt content of about 2.5 to about 2.75% is adequate, but for a shelf life longer than this, e.g. six weeks, the salt content must be increased up to 2.75 to 3.5% by weight. Such high salt contents cannot be achieved by injection of brine into meat, and it is necessary to follow such injection with an immersion in a brine bath if this level of salt is required.

There has been considerable interest in recent years in curing meat inside sealed plastic bags. To operate this method, the meat is first injected with brine in the manner already described, and the injected meat is then placed in a plastic bag which is sealed and usually heat shrunk. After the salt has had time to permeate evenly through the meat, the cured meat may be removed from the bag and sliced and repackaged in the usual way. This method of curing meat has the advantage of greater cleanliness and avoiding the use of brine baths. However, it has not heretofore been possible to achieve salt contents over about 2.75% using this method of curing meat in a bag. The present invention provides a method of overcoming this problem.

According to the present invention meat, especially pork, is cured by injection of saturated brine which has suspended therein salt particles capable of passing through a sieve having apertures of 100 micrometres, and preferably capable of passing through a sieve having apertures of 50 micrometres. Such so-called "microfine salt" is commercially available for incorporation into butter where the fine particle size is required to permit homogeneous mixing and prevent any sensation of grittiness in the butter. Salt of ordinary particle size cannot be used in the present invention since it clogs the injection nozzles and cannot be satisfactorily injected into the meat.

The suspension of microfine salt in brine may be made up at the time of use. The saturated brine itself may be made by dissolving ordinary coarse salt in water with the addition of the usual preservatives such as nitrates, nitrites and/or ascorbic acid in the usual amounts. The microfine salt is then added at a rate dependent upon the desired final salt content of the meat, usually at a rate of 20 to 80 parts by weight preferably 35 to 70 parts by weight, of microfine salt per 1000 parts by weight of saturated brine. As already indicated, the normal levels of preservatives may also be added to the injection mixture. Since there is a danger of recrystallization of the microfine salt if it remains suspended in the brine for any length of time, it is desirable to make up the suspension for injection only shortly before it is required for use.

The present invention is especially advantageous for use with methods for curing meat, e.g. pork, in sealed plastic bags since it provides a solution to the above-mentioned problem, namely that salt levels above about 2.75% cannot be achieved using this method simply by injecting saturated brine into the meat. The invention thus makes it possible to produce bacon and other salted meats having a shelf life of six weeks using the method of curing meat in a sealed plastic bag.

The following Examples describe in more detail the salting of meat using the method of the present

invention.

EXAMPLE 1

Joints of pork weighing 3 to 12 kg each and containing no bone were injected using a multi-needle injector (Formaco) with a brine mixture having the following composition:

5 water : 740 parts by weight  
pure vacuum dried (PVD) salt: 260 parts by weight  
microfine salt : 64 parts by weight  
10 nitrate and nitrite : usual levels

The PVD salt was dissolved in the water before the addition of the microfine salt. This suspension of microfine salt in brine at a temperature of +1°C to +2°C was injected into the meat held at a temperature of 4°C to 5°C. The amount injected was such as to add to the meat 9.8% of water and 3.2% of salt. After injection the joints of meat were packaged in standard heat shrinkable plastic laminate bags (as sold under the registered trade mark Cryovac BB1).

The joints subjected to this process were 10 middles, 10 backs, 10 streaks, 10 legs and 10 fores.

Analysis of the joints of meat after 7 days showed that the middles contained 3.1% to 3.2% salt, the backs 3.0% to 3.1% salt, the streaks 2.2% to 2.3% salt, the legs 2.3% to 2.7% salt, and the fores 3.2% to 3.6% salt. The low figures obtained with the streaks can be accounted for by the presence of less lean meat in cuts of this kind. It is the lean meat that takes up the salt. The low figure with the

legs was attributable to variations in brine injection. As shown in Example 2, with careful control of brine injection the required salt level can be achieved without difficulty.

EXAMPLE 2

5           Pork sides divided into a variety of different cuts were injected with a brine comprising:

          water                 : 531 parts by weight  
          PVD salt             : 184 parts by weight  
          microfine salt : 40 parts by weight  
10           nitrite             : normal amount

The brine temperature was +5°C and the meat temperature was 3°C to 4°C. A multi-needle Formaco injector was used, the objective being to add 10% of water and about 3.5% of salt to the meat. After injection, the major cuts were sub-  
15 divided and enclosed in sealed plastic bags to complete the curing process. It was found that the middles took up 4.6% of salt, the backs 3.3% of salt, the streaks 2.3% of salt, the legs 3.8% of salt, the range of salt contents for the various cuts being from 2.3% to 4.6%. Again the low  
20 percentage of salt achieved with the streaks was attributable to the high proportion of fat in this cut.

The present invention provides a significant improvement in the curing of meat, especially pork, in sealed plastic bags. Heretofore the inherent advantages of  
25 this method in terms of greater flexibility and better protection for the meat during the curing process have been to some extent reduced by the impracticability of achieving



The claims defining the invention are as follows:

1. Method for curing meat with salt which comprises injecting into meat saturated brine having suspended therein solid salt having a particle size not greater than 100 micrometres.

5 2. Process according to claim 1 in which the salt has a particle size less than 50 micrometres.

3. Process according to claim 1 or 2 in which the salt is injected to provide a salt content from 2.75% to 4% by weight of the meat.

10 4. Process according to claim 3 in which the meat is injected with not more than 10% by weight of added water.

15 5. Process according to any one of claims 1 to 4 in which the salt suspension contain 20 to 80 parts by weight of the said finely divided salt per 1000 parts by weight of saturated brine.

20 6. Process according to claim 5 in which the said salt suspension contains 35 to 70 parts by weight of the said finely divided salt per 1000 parts by weight of the saturated brine.

7. Process according to any one of claims 1 to 6 in which the brine also contain water-soluble meat preservatives.

25 8. Process according to any one of claims 1 to 7 in which the meat injected is pork.

9. Process according to any one of claims 1 to 8 in which after the injection the meat is kept in a sealed plastic bag until the salt has become essentially evenly distributed throughout the meat.

10. A process according to claim 1 substantially as hereinbefore described with reference to the Examples.

11. A meat product when produced by a process according to any one of claims 1 to 10.

Dated this 25th day of January 1991

W.R. GRACE & CO.-CONN.

By its Patent Attorneys

DAVIES & COLLISON

