UNITED STATES PATENT OFFICE.

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PROCESS FOR CURING MEATS.

1,259,376. Specification of Letters Patent. Patented Mar. 12, 1918.

No Drawing. Application filed December 13, 1915. Serial No. 66,506.

To all whom it may concern:

Be it known that GEORGE F. DORAN, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Processes for Curing Meats, of which the following is a specification.

The present invention relates to the art of curing meats, and particularly those that depend on the curing effects of sodium or potassium nitrates in conjunction with salt brine and granulated sugar, or its equivalent in syrup. The main objects of the invention are to produce in a convenient and more rapid manner a complete cure of packing house meats; to increase the efficiency of the meat-curing art; to produce a milder cure; and to produce a better product from a physiological standpoint.

To accomplish these results, I bring into use soluble nitrites suitable for the purpose such, for example, as potassium or sodium nitrite or other alkali metal nitrite, either in the form of the chemically pure or commercial salts, or salts formed by bacterial action from sodium nitrate, potassium nitrate, or other alkali metal nitrate, or I use sterilized waste pickling liquor which I have discovered contains soluble nitrites produced by conversion of the potassium nitrate, sodium nitrate, or other nitrate of the pickling liquor when fresh, into nitrites, as such waste pickling liquor is taken from the cured meats. Nitrites suitable for use in carrying out the present invention may be produced by bacterial action from nitrates and fresh pickling liquor by adding a small percentage of old used pickling liquor. The bacteria in old pickling liquor are reducing bacteria and change nitrates to nitrites.

My process, as it is preferably used in practice, may be described as follows:—As applied to ham-house products, the following procedure is preferably carried out:—The products are saturated by inserting perforated needles in various parts of the same (preferably in the vital points) and forcing pickling liquor containing small amounts of the nitrites through these perforated needles by means of a hand pump. In regular packing house procedure, pickling liquor, common called "pumping pickle," is used, such pickling liquor consisting of a saturated salt brine solution containing three per cent. of sodium or potassium nitrate. I however, take the saturated brine solution and add about three quarters of one per cent. of sodium or potassium nitrate, and from .05% to .35% of potassium nitrite or sodium nitrite, or the bacterial equivalent thereof. After pumping with this pickling liquor containing the nitrites, as hereinbefore described, the products are placed in tierces containing pickling liquor, which latter contains from 13 to 18 per cent. of salt, one per cent. of sugar or its equivalent in syrup, and .05% of potassium or sodium nitrite, or the bacterial equivalent thereof. The products are then kept at low temperature in chill rooms or coolers for a period of 20 to 40 days, depending on the size of the hams, and at the end of such period, the products are washed and then sent to the smoking room where they are kept for several days exposed to smoke. After this, the products are finished and ready for inspection.

In cases where the products are to be cooked before shipping from the plant, as is the case with corned beef or cooked ham, the process is more rapid because of the relatively higher temperatures employed. It is found that boiling temperatures develop the cures rapidly.

In treating corned beef in accordance with the present invention, the following procedure may be followed:—The meat is cut up into pieces about one inch in size and extracted with warm water for thirty minutes, preferably at a temperature of approximately 40° centigrade. Next, the extracted meat is withdrawn from the warm water and immersed in a 70° brine solution containing .05% to .10% of sodium nitrite, potassium nitrite, or the bacterial equivalent thereof, for a period of one half an hour, after which time the temperature is brought to the boiling point. When the meat has been boiled sufficiently, the cage containing the meat is withdrawn from the vat and sent to the packing department where it is canned and vacuumed and exposed to live steam under ten pounds pressure in a closed retort for a period of one hour and a half.

In treating cooked hams in accordance with the present invention, the procedure is somewhat different but the results are due to the same causes, that is, the heat treatment, and the presence of the nitrites in the pickling liquor. For example, the raw hams are trimmed free from bones and excess of

fat and then pumped with pickling liquor in a manner similar to the regular method hereinbefore described but containing .05% to .35% sodium or potassium nitrites or their bacterial equivalent. The boned hams after pumping with pickling liquor are then placed in tierces containing brine, niter and nitrites, and sugar (or their equivalent) and kept there for a period of time varying from three days to twelve days, this depending on the size of the hams, the larger ones requiring the longer treatment. The hams are then placed in a canvas or cloth covering and then inserted into a perforated iron cylinder and compressed until fairly tight. The cylinders with their contents are then placed into tanks containing water or brine heated to a temperature ranging between 140° to 220° F., or a temperature sufficiently high to coagulate albuminous matters, and subjected to this heat for about twenty hours. Brine or water may be used, depending upon whether a mild or a salty flavor is desired by the trade. At the end of this treatment, the cylinders with their contents are removed to a cooler and there allowed to cool down to a low temperature, this causing the hams to assume a firm and fairly permanent shape. The hams may then be twined with a heavy cord to maintain them in permanent shape and they are then ready for shipment, unless a smoke flavor is desired, in which case, the hams are sent to the smoke-house.

I have found that meats treated in accordance with the present invention, as hereinbefore described, have a superior and milder flavor as compared with the average products now on the market. This is due to the fact that I have eliminated 75% of the nitrate formerly used in making the pickling liquor. The products do not have an after taste, due to excessive nitrates, or excessive saltiness, due to excessive processing. Observations extending over a long period of time have proved that the products hold up satisfactorily at ordinary temperatures. Analysis has shown that the niter content of the meats as processed by me has been reduced by 50%, as compared with means now on the market. This improves the products from a physiological standpoint.

The process as carried out with a pickling liquor to which the nitrites are added in the form of the chemically pure or commercial salts is claimed generically but not specifically herein, this specific process forming the subject-matter of a divisional application, Serial No. 94,486, filed April 29, 1916.

I claim as my invention:—

1. The improvement in the art of curing meats which consists in treating them with pickling liquor containing small amounts of soluble nitrites.

2. That improvement in the art of curing meats which consists in treating the same with sterilized pickling liquor containing nitrites formed from nitrate solutions by bacterial action.

3. That improvement in the art of curing meats which consists in treating them with pickling liquor containing small amounts of alkali metal nitrites.

4. The herein described improvement in the art of curing meats which comprises submitting the same to the action of a pickling liquor containing nitrites formed by bacterial action in old used pickling liquor.

5. That improvement in the art of curing meats which consists in submitting the same to the action of sterilized old and used pickling liquor containing nitrites formed therein by bacterial action.

6. That improvement in the art of curing meats which consists in adding to the meats pickling liquor containing nitrites.

7. That improvement in the art of producing cooked cured meats which consists in submitting the same to the action of soluble nitrites in small quantities at a temperature ranging between 140 and 220° Fahrenheit.

8. That improvement in the art of producing cooked cured products which comprises submitting the same to the action of a sterilized pickling liquor containing bacterial nitrites formed from old and used pickling liquor, and boiling the products at a temperature sufficient to coagulate albuminous matters.

9. That improvement in the art of curing meats which consists in subjecting the same to the action of a pickling liquor containing nitrites formed by adding to the pickling liquor small amounts of a nitrite-producing agent, thereby shortening the time of cure.

10. That improvement in the art of producing cooked cured products which consists in subjecting the same to the action of a pickling liquor containing nitrites formed by adding to the pickling liquor a nitrite-producing agent, and subjecting the products to a temperature ranging from 140 to 240° Fahrenheit, thereby shortening the time of cure.

11. Method of pickling meats and meat goods, consisting in the meat being treated with a mixture of salts, which contain besides common salt an addition of nitrite.

In testimony whereof, I have affixed my signature in presence of two witnesses.

GEORGE F. DORAN.

Witnesses:

HIRAM A. STURGES,

ARTHUR H. STURGES.