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ALIEN PROPERTY CUSTODIAN

PRESERVES OR CANNED FOODS AND THE PRODUCTION THEREOF

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This invention relates to the production of preserves enclosed in hermetically sealed containers, and one object of the invention is to provide a method or process or an improvement in the known processes or a treatment in connection with the production of the said preserves, so that the tendency to blow or swell is reduced. The invention relates also to preserves enclosed in hermetically sealed containers, the composition of said preserve being so, that the risk for occurrence of swelling during the storage thereof is less than in the case of known preserves of the corresponding kind.

In the production of preserves enclosed in hermetically sealed containers the fault will often be met with which in the case of canned foods is called swelling or blowing (the swelled can is frequently called a springer or flipper) and which in the following specification and the claims will also be referred to as swelling in the case where it is not cans that are to be considered but containers of other kinds f. inst. glasses or bottles, having a content of hermetically enclosed preserved foods. The swelling consists in that the preserved foods are attacked and deteriorated by gas-producing anaerobic bacteria which in most cases are spore-forming. The gases developed will consist completely or partially of hydrogen. In the case of preserves enclosed in cans swelling will manifest itself in that the endwalls of the can will bulge.

In order to combat this phenomenon it is important that the goods to be preserved are as fresh as possible and are treated as cleanly as possible. Furthermore antiseptics i. e. substances which are more or less capable of destroying or killing microorganisms are frequently added to the preserves. Owing to the fact, however, that as a result of instability (confer f. inst. hydrogen peroxide) these substances are not capable of inhibiting the development of bacterial spores or that as a result of poisonousness they cannot be used in proportions sufficient to inhibit the development of the more resistant microorganisms it has not been possible to attain in this manner a complete suppression of the tendency to swell. In the case of semi-preserves which have not been subjected to a sterilizing heat treatment, swelling will frequently take place after storage of the containers for only a few weeks, but even in the case of preserves which have been subjected to sterilization by heat, it is not possible to ensure so complete and safe a destroyal of all microorganisms and their spores that it can be pre-

vented that the said phenomenon will occur now and then.

I have now found that the tendency to swell can be avoided or the frequency thereof materially reduced by the employment of certain salts in connection with which it can be proved by measurement that they impart to the liquid phase present a high level of oxydation (redox-potential). Thereby they restrain the vital activity of the microorganisms producing the swelling and, under many circumstances, they are causing the said activity to be perfectly discontinued. The manner of action of these salts is thus different from the manner of action of antiseptics, no attempt being made to destroy the microorganisms in question. When the level of oxydation is again lowered, it has been found in experiments that the microorganisms, if present, will be capable of exerting their vital activity again and thus produce the development of gases which causes the phenomenon of swelling.

The salts which I have found useful according to my experiments are soluble bromates and iodates which salts, being inorganic salts having a perceivable ascending influence on the level of oxydation in an aqueous phase and being closely chemically related constitute a group of substances. The soluble chlorates will not belong to the same group owing to the fact that according to measurements that have been made these salts, although disinfectants, are so restrained in their action that the simple addition thereof will not raise the level of oxydation of the liquid phase. A similar behaviour is found in the case of a number of other substances known as oxydants and the said group of substances thus cannot even be extended to f. inst. the oxy halogen acids in general.

My invention in its widest aspect thus involve incorporating in anaerobically inclosed preserves before sealing the container a substance belonging to the group comprising soluble bromates and iodates.

With these general statements of the objects and purposes of my invention I will now proceed to describe certain embodiments thereof and the manner in which my invention is practically carried out and it will be understood that while I have described what may be considered as preferable embodiments of my invention I do not limit myself to the precise conditions or proportions herein set forth as they may be varied by those skilled in the art in accordance with the particular purposes for which they are intended and the conditions under which they are utilized.

Example 1

Herrings or similar small fishes are deprived of scales, washed, opened and the intestines are removed as well as the bones if so desired. Thereafter they are treated in a solution of 3-5% sodium chloride and a small proportion of hydrogen peroxyde in water which treatment serves the purpose of removing the blood and to some extent prevent the development of microorganisms. After a few hours the fishes are placed in a marinade containing 6 pct. vinegar and 8 pct. sodium chloride in water (2 parts of fishes to 1 part of marinade). To the marinade has been added 10-100 gr. sodium bromate, potassium bromate, sodium iodate or potassium iodate to each 100 liters marinade. When tender the fishes are placed in cans and covered with a pickle composed in accordance with the particular recipe of the manufacturer and in accordance with the flavour which it is desired to give to the fishes. Moreover sliced onions, cucumbers or herbs are added. The onions must be treated in advance in a bath of salt and vinegar. The composition of the pickle is without importance to the invention and those skilled in the art will be able to vary the recipe in numerous ways. If desired, however, the pickle can be of the same composition as the marinade. According to the invention sodium bromate, potassium bromate, sodium iodate or potassium iodate is added to the pickle in a proportion of 3-30 grammes pro 100 liters before the pickle is poured in the cans. The cans are sealed and cured for a few weeks.

Example 2

In order to produce balls of minced fish filet of cablrau is milled and stirred with finely cut onions, bread softened in water, butter, pepper and salt. The mince-meat is shaped to balls and cooked in salt water containing herbs, if so desired, and sodium bromate, potassium bromate, sodium iodate or potassium iodate in a proportion of 3-30 grammes pro 100 kgs. of the total weight of water and mince-meat. The balls are then removed from the water and placed tightly in a can which is then filled up with fish soup to which sodium bromate, potassium bromate, sodium iodate or potassium iodate has been added in the proportion of 3-30 grammes pro 100 liters of soup. The can is completely filled, closed and sterilized by heating in retorts at 115° in 7-20 minutes.

Example 3

Meat of beef is salted for the purpose of being used to corned beef and sodium bromate, potassium bromate, sodium iodate or potassium iodate is added to the brine in the proportion of 3-30 grammes pro 100 liters of the total volume of brine and meat. After curing the meat is removed from the brine, cut and pressed into the cans after which it is covered by a solution of gelatine, containing 3-30 grammes of sodium bromate, potassium bromate, sodium iodate or potassium iodate to each 100 liters of the solution, so as to fill the cans completely. The cans are closed and processed in order to sterilize their contents. For this purpose cans of ¼ kg. are heated in 50-55 minutes, whereas cans of ½ kg. are heated for 70-80 minutes in the retort, the temperature of the same being raised to 110-116°.

Example 4

To mince-meat for sausages is mixed 0,1 0/00 by weight of sodium bromate, potassium bromate,

sodium iodate or potassium iodate dissolved in a small quantity of water. The said salt is homogeneously intermixed with the mince-meat by intimate stirring. From the mince-meat thus treated sausages are produced in the usual manner by filling it into guts. The sausages are placed in cans, which are afterwards filled up by brine containing 0,1 0/00 sodium bromate, potassium bromate, sodium iodate or potassium iodate. The cans are sealed and processed. As a result of the addition of the said salt processing may be restricted to a heating to 100° C. for abt. 30 minutes in the case of cans of ½ kilo.

Example 5

Meat is cooked with water, the soup is separated and thickened with flour and butter at the same time adding colour and spices after which it is again poured over the meat to produce a dish. The meat may be beef, veal, pork, poultry or games. During the production sodium bromate, potassium bromate, sodium iodate or potassium iodate is added in the proportion of 3-30 grammes to each 100 liters of the total volume of the food. The same is placed in cans which are closed and processed as stated in Example 3.

Example 6

Pease are deprived of the hulls and vines, graded, washed and placed into the baskets of the blanching vessel, after which they are blanched. The blanching solution may contain pro 100 liters 15 grammes of sulphate of copper and 25 grammes of sulphate of potassium and furthermore sodium bromate, potassium bromate, sodium iodate or potassium iodate is added in a proportion of 3-30 grammes pro 100 liters of the total volume of blanching solution and pease. The pease are then removed from the blancher, cooled, placed in cans and poured over with a solution of 1% salt and 3-30 grammes of sodium bromate, potassium bromate, sodium iodate or potassium iodate pro 100 liters of water or pro 100 liters of the total volume of the tins, if so desired, in order to obtain a higher degree of security. In the latter case the addition of sodium bromate, potassium bromate, sodium iodate or potassium iodate to the blanching water may be avoided. The tins are exhausted and sealed at 50-75° after which they are processed in 7-20 minutes at 115-116° C.

I have spoken above of the sodium and potassium salts of the bromic and iodic acids, but evidently the cation of these salts is generally without importance, so that f. inst. the corresponding ammonium, calcium or magnesium salts can be used with the same results. The important thing is only that the salt must be soluble and that in the concentrations in which the cation is used it must have no noxious or poisonous action. Thus, by way of example, bromate of lead, according to the statements in the chemical literature, is sufficiently soluble, but of course great caution will be required in view of the poisonousness of the compounds of lead.

The proportions mentioned in the preceding part of the specification are such proportions which have been found very active in experiments with semi-preserves as well as with other preserves, in the production of which an incomplete sterilization has been carried out in order to be able to produce conditionally the phenomenon of swelling. It is evident, however, that a somewhat greater proportion will afford, in diff-

cult cases, a greater security than a small proportion, and in view thereof it will be natural in cases where swelling is particularly feared to restrain from using proportions corresponding to the lower limit given in the examples mentioned above. On the other hand, in cases where experience has learned that swelling will not occur frequently smaller proportions than those given above may be employed, f. inst. 1 gramme pro 100 liters or kilogrammes. The proportions are not so critical that it will be necessary to take into consideration whether f. inst, a potassium salt or a sodium salt is used although from a theoretical point of view the latter will of course contain a smaller proportion of the active ion pro gramme than the former.

When, in the preceding specification and in the claims, sterilization is mentioned there is not the question of an absolute sterilization, but of a technical sterilization in which regard is taken, as it is usually the case in the canning industry, to the fact that the goods in question will not always be able to endure a strong heating of long duration without being changed more than desirable, and to economical and practical conditions. In the preserved goods thus treated it will not unfrequently be possible to find living microorganisms and still more frequently it will be possible to find facterial spores.

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