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PATENT SPECIFICATION

NO DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Quick Cooking Foodstuffs

5 We, DAVID ADRIAN LEWIS, VICTOR MARCUS LEWIS and JOHN MOSELEY LEWIS of 18 George Street, Miranda, New South Wales, Australia, 6 Bogata Street, Neutral Bay, New South Wales, Australia and 17 Norfolk Street, Killara, New South Wales, Australia, respectively, all citizens of the Commonwealth of Australia, do hereby declare the invention for which we pray that a
10 patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

15 This invention relates to quick cooking foodstuffs prepared from grains, seeds and farinaceous food products which grains, seeds and farinaceous food products have a starch content in excess of 50%.

20 The invention has been devised to provide a quick cooking foodstuff of the type described which when prepared according to the invention retains most of the essential food elements of which it is comprised, which will remain stable, that is in its prepared condition,
25 for indefinite periods even under adverse climatic conditions, and which is resistant to attack by for example vermin, weevils and larvae.

30 Rice grains, for example, in a natural dry state have a moisture content of approximately 8% to 14%. By cooking, the starch and other constituents are hydrated and the starch is gelatinised and when in an edible state has a moisture content of about 65% to
35 80% or higher. This increase in moisture content is usually achieved by boiling the grains for relatively long periods and, in the case of certain types of grains, it is sometimes necessary to subject the grain to preliminary
40 hydration in order to make the starch and other constituents capable of being readily cooked.

In an attempt to shorten the final (consumer's) cooking time of rice it has been pro-

posed hitherto to subject the foodstuff to partial precooking and substantial dehydration before it is packed for sale. Rice prepared in this manner is known as quick cooking rice.

According to the present invention foodstuffs of the type described are prepared for
50 sale as quick cooking foodstuffs by first impregnating grains, seeds or farinaceous foods having a starch content in excess of 50% with a solution of water and sodium chloride until a uniform penetration of the solution throughout the foodstuff is achieved. Subsequently the
55 surface moisture may be removed from the foodstuff. For certain foodstuffs within the type described the foodstuff is removed from the solution prior to a uniform penetration, and in such case the foodstuff is held in a condition which will permit a uniform penetration of the already contained saline solution. The foodstuff is then in a saleable condition as a quick cooking foodstuff and it will
60 remain stable for indefinite periods.

The uptake of saline solution varies considerably with the type of foodstuff treated. For rice, the maximum uptake, depending on the type of rice, is between 25% to 100% of
70 the weight of the rice at room temperature. For spaghetti and other alimentary pastes the maximum uptake is approximately 80% of the weight of the paste.

The period of soak (impregnation) may be
75 conveniently shortened by raising the temperature of the saline solution. Although it is not essential to the performance of the invention, it is preferred to soak the foodstuff in a saturated or near saturated saline solution at a temperature within the range of 32—180°F for a period of 5 minutes to 72 hours.

Salt introduced into a foodstuff as aforesaid increases the rate of uptake of water and consequently the rate of gelatinisation of
85 the constituent starch during subsequent cooking processes. Consequently the cooking time is substantially reduced and the foodstuff is

[Price 4s. 6d.]

more evenly cooked than was possible hitherto. Additives such as preservatives, flavourings, colourings, minerals and vitamins may be added to the foodstuff per medium of the saline solution if desired.

Certain micro-organisms such as *Sporendonema* spp., *Penicillium* spp., *Micrococcus* spp., *Aspergillus* spp., may be encountered which are capable of very slow growth on foodstuffs which have been treated according to the invention. Most of these organisms do not grow at reduced (refrigerator) temperatures, nor at sustained temperatures of about 100° F. or above. They are mainly subject to inactivation by heat at very moderate pasteurisation temperatures for short times. When such salt resistant organisms are likely to be encountered, it is desirable to carry out one or more of the following operations, namely:—

(a) add an additional preservative such as sulphur dioxide, sorbic acid or its derivatives, benzoic acid or its derivatives where this is permitted by law,

(b) hold the foodstuff in cold storage,

(c) hold the foodstuff in warm storage,

(d) pasteurise the foodstuff within its package,

(e) gelatinise the foodstuff and reduce its moisture content sufficiently, for example from 5% to 15% of the soaked weight of the foodstuff so that it becomes unsuitable as a growth medium for micro-organisms,

(f) pack and hold the foodstuff in a vacuum.

When the foodstuff is to be packed into units for sale for use, the treated foodstuff may be packed into a bag or container which is not subject to damage by heat and sealed and the sealed container then subjected to a conventional form of heating for the purpose of pasteurising the foodstuff. During pasteurisation the starch in the foodstuff will become gelatinised to some extent. This does not hinder the subsequent cooking and eating qualities of the foodstuff and in the case of grain and seed foodstuff, the individual grains and seeds when gelatinised are less brittle and more resistant to impact than if they are not gelatinised.

When the foodstuff is to be packed in bulk containers where heat penetration during pasteurisation could be incomplete, the foodstuff may be pasteurised prior to packing and then partly dehydrated, for example by between 5% to 15% of the soaked weight of the treated foodstuff. The foodstuff may then be handled in bulk in a normal manner as long as packaging is such as to prevent further substantial loss of moisture.

Depending on atmospheric conditions, the treated foodstuff, if left exposed to the air, will continue to lose weight as moisture, until a fairly stable final weight is reached. Foodstuffs "dried" in this manner have excellent keeping and handling qualities and are still a quick cooking foodstuff. Foodstuffs so treated

will not be subject to microbial spoilage so long as excessive moisture absorption after preparing as aforesaid is prevented.

The soaked foodstuff may be dried to 85% of its soaked weight without gelatinisation to avoid microbial spoilage but in this instance the foodstuff may become more brittle than gelatinised foodstuffs of a similar moisture content.

It is entirely practicable and feasible to effect gelatinisation plus preheating, followed by filling the foodstuff hot (say 150° F.—200° F.) into a container, which is then sealed immediately. Such a container or package should be substantially moisture-proof and in this regard bags made from polythene or "Saran" (Registered Trade Mark) coated films or papers are satisfactory.

V) It is also satisfactory to pack the soaked and gelatinised or ungelatinised foodstuff in a container under vacuum.

Foodstuffs treated in the manner described herein are prepared for consumption by boiling in a quantity of water which is sufficient to absorb the contained salt. For most purposes, it has been found that a volume of water 6 to 8 times the weight of the foodstuff produces a palatable product.

It is also within the scope of this invention to partially cook the foodstuff after it has been impregnated with the saline solution. The partially cooked foodstuff is then dehydrated to remove the bulk of the moisture content. This results in a substantially dry product which may then be packed in a conventional manner.

WHAT WE CLAIM IS:—

1. A method of preparing quick cooking foodstuffs comprising grains, seeds or farinaceous foods, said foodstuffs having a starch content in excess of 50%, the method comprising the steps of impregnating the foodstuff with an aqueous solution of sodium chloride until a uniform penetration of the solution throughout the foodstuff is achieved.

2. A method according to Claim 1 wherein the sodium chloride solution is saturated or nearly saturated.

3. A method according to Claim 1 or Claim 2 wherein the impregnation is performed at a temperature of from 32° to 180° F for a period of from 5 minutes to 72 hours.

4. A method according to any of the preceding Claims comprising the additional step of pasteurising the foodstuff after the impregnation step.

5. A method according to any of the preceding claims wherein the foodstuff is further treated to effect gelatinisation or partial gelatinisation thereof.

6. The method according to any of the preceding claims wherein the foodstuff is permitted to absorb between 25 and 80% of its weight of the sodium chloride solution.

7. A modification of the method according

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- 10 foodstuffs which have been treated according to the invention. Most of these organisms do not grow at reduced (refrigerator) temperatures, nor at sustained temperatures of about 100° F. or above. They are mainly subject to
- 15 inactivation by heat at very moderate pasteurisation temperatures for short times. When such salt resistant organisms are likely to be encountered, it is desirable to carry out one or more of the following operations, namely:—
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- (b) hold the foodstuff in cold storage,
- 25 (c) hold the foodstuff in warm storage,
- (d) pasteurise the foodstuff within its package,
- (e) gelatinise the foodstuff and reduce its moisture content sufficiently, for example from
- 30 5% to 15% of the soaked weight of the foodstuff so that it becomes unsuitable as a growth medium for micro-organisms,
- (f) pack and hold the foodstuff in a vacuum.

- When the foodstuff is to be packed into
- 35 units for sale for use, the treated foodstuff may be packed into a bag or container which is not subject to damage by heat and sealed and the sealed container then subjected to a
- 40 conventional form of heating for the purpose of pasteurising the foodstuff. During pasteurisation the starch in the foodstuff will become gelatinised to some extent. This does not hinder the subsequent cooking and eating
- 45 qualities of the foodstuff and in the case of grain and seed foodstuff, the individual grains and seeds when gelatinised are less brittle and more resistant to impact than if they are not gelatinised.

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5. A method according to any of the preceding claims wherein the foodstuff is further treated to effect gelatinisation or partial gelatinisation thereof.

6. The method according to any of the preceding claims wherein the foodstuff is permitted to absorb between 25 and 80% of its weight of the sodium chloride solution.

7. A modification of the method according



- to any of the preceding Claims wherein the uniform penetration of the sodium chloride solution throughout the foodstuff is achieved by the steps of impregnating the foodstuff in the sodium chloride solution, removing the foodstuff from the solution and holding the foodstuff in a condition which will permit uniform penetration of the solution contained therein.
5. 8. A method according to any of the preceding claims wherein the treated foodstuff is subsequently dehydrated until 5% to 80% of its total weight is lost.
10. 9. A method according to Claim 8 comprising the step of partially cooking the foodstuff before de-hydration. 15
10. A method of preparing quick cooking foodstuffs according to Claim 1 substantially as hereinbefore described.
11. Quick cooking foodstuffs whenever prepared by a method according to any of the preceding Claims. 20
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